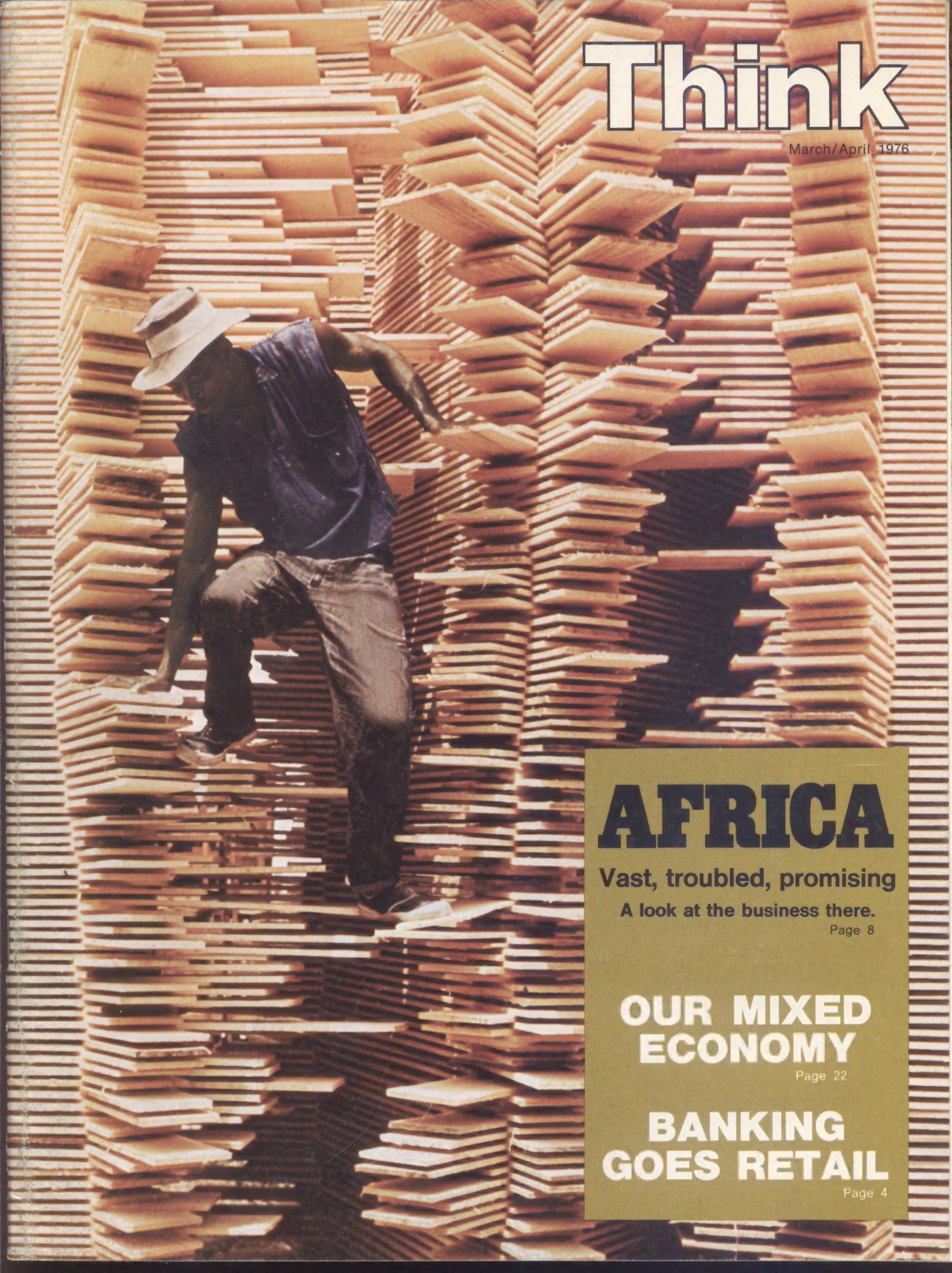

Think

March/April 1976

AFRICA

Vast, troubled, promising

A look at the business there.

Page 8

OUR MIXED ECONOMY

Page 22

BANKING GOES RETAIL

Page 4

Letter from the Chairman

IBM—still special. And it's people who make it so.

After watching us weather the worst business slump in 30 years, a lot of non-IBMers ask me what's so special about this company, what makes IBM unique. "Is it because you sell computers and office products?" they say. "Is it your rental business? Or your marketing techniques?"

All of those things miss the mark. If they're looking for the key to our success, I tell them, it's good people. And I mean it.

For the last several years, we have had to make a special effort in order to maintain employment security, long a cornerstone of IBM. Your response has been magnificent.

Since the beginning of last year, more than 3,800 of you have participated in transfer programs, some moving across the aisle, some across the country. IBM people have relocated to the places where they were needed—from Poughkeepsie to Boulder, from Manassas to Burlington. Some 1,700 of you have trained for entirely new careers. Manufacturing people have become customer engineers. Staff professionals have gone into marketing.

Last year, too, you helped brighten the work load picture by responding to the request to take both your annual vacation and some deferred vacation. The total time taken—over and above normal vacations—was equivalent to about 1,000 people working for a year. That took a lot of the strain off our work load imbalances.

Your cooperation and flexibility—often in the face of personal sacrifice and inconvenience—helped forge our success during the turnaround year of 1975. It has gotten us off to a solid start in '76.

I wanted to take this opportunity to say thank you for all you have done.

Frank Cary

Think
Volume 42 Number 2
March/April 1976

Features

Letters 3
Energy 35
$1-Billion 44
In Brief 50
Speak Up 56

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4

Banking goes retail

How terminals help make it pay.

The byword in banking these days is Electronic Funds Transfer. Instead of chasing customers over the landscape by building new branches, many banking institutions are bringing new services to customers through on-line automated teller terminals. In the process, they are enabling customers to handle their money in new ways and, not incidentally, attracting the capital banks need. The trend toward EFT is even more pronounced abroad where institutions such as Lloyds Bank in England have already placed IBM terminals in supermarkets and department stores for instant transfer of funds.

8

Africa notebook

For an old continent, new life. How IBM is fitting in.

Frank T. Cary and a team of IBM executives take a first-hand look at the business there.

14

Corporate Awards

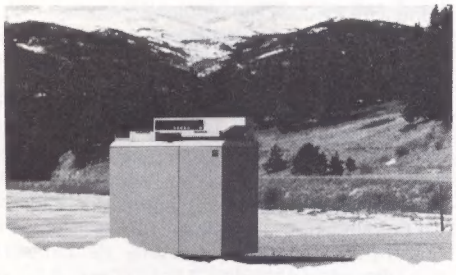
IBM's rites of Spring.

At the annual banquet, four join the ranks of IBM Fellows, this year's Award winner gets a $15,000 prize, and Emanuel R. Piore is honored.

16

From Boulder—the new 'Everything Machine'

It's the Series III Copier line. It copies, duplexes, collates—automatically. At 75 copies a minute.



22

Our mixed economy

Government and business. Part V in the series on business and how it works.

With Walter W. Heller, chief economic adviser to President John F. Kennedy. Yes, says Heller, the public's "annoyance index" at the growth of government may be climbing to a new high. But he argues that we are far from sliding down the road to socialism and offers facts to document his views. What are the measures of government growth and how does one strike a balance between too much and too little regulation? You may find some reassurance in what Heller has to say.

26

Politics and economics. Together again?

Noted columnist and professor Max Lerner foresees a happy remarriage between the two.

For years, says Max Lerner, Americans have not raised their political leaders to understand the mysteries of economics, nor their business leaders to swim like fish in the waters of politics. But he sees the pressures of events bringing them together—economics with its tough-mindedness and its imperative for making ends meet; politics with its power and leadership and commitment to an ordered society.

30

Good riddance

After almost 15 centuries of pestilence, smallpox is on the way out. With the help of a computer.

32

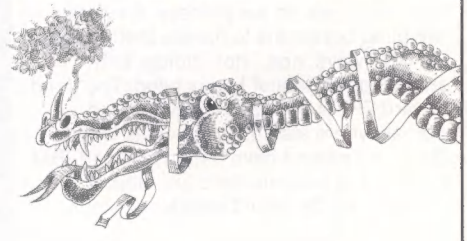
Report from Foley Square

What's happening in that Justice Department antitrust suit?

36

Taming the dragon

How computer models help businessmen cope with the twists and turns of an economy that's always changing.



40

IBM Philippines

A small company. But it has set its cap for bigger things.

49

You don't have to be big to be good

New things continuously bubble up next to old in the Information Records Division, which markets an astounding variety of products—from general-purpose punched cards to diskettes and data modules. While it is one of IBM's smallest divisions, it is also one of the most spirited in supporting Data Processing and General Systems Division systems. IRD, which weathered the recession in fine style, seems to prove the old adage that good things often come in small packages.

52

New name on the door

General Business Group/International

What does a 24-year-old, two-time Brazilian judo champion have in common with a veteran Belgian marketing executive who recently attended his 25th straight Hundred Percent Club? Both, along with 27,000 other General Systems and Office Products employees in 17 countries outside the U.S., belong to a fast-growing portion of IBM's business which, since last July, has received functional guidance from a new U.S. division, General Business Group/International. Here, a look at some members of the marketing team in the GBG/I family.

Letters

Why not limit growth?

Dr. Brubaker ("Dwindling Resources," Jan./Feb. *Think)* bases his argument for a growth economy on the implicit premises that nongrowth economies provide no challenges to a free enterprise system, and since they are not a part of the American past they shouldn't be in the future. . .

Does nongrowth within the free enterprise system really preclude a healthy economy? Wouldn't it be wiser to redefine our challenge and redirect our technology toward a more stable yet dynamic economy that puts a sane limit on growth?

David E. Westphal
Moss Beach, Calif.

Check that I.D.

The system on page 6 of the "Fastest 25 Years" article in your January/February 1976 issue of *Think,* identified as Naval Ordnance Research Calculator is definitely not. I believe it to be one of the 700 Series calculators.

K. A. Bell
Rochester, Minn.

(Editor's note: You're right. Our source was wrong.)

Transistors upside-down

I wish to compliment the whole staff on the *Think* Magazine for their wonderful production of the January/February 1976 issue covering 25 years of computer development. It brings back fond memories.
However, I feel that the color photo on pages 8 and 9 would be much more dramatic . . . if it were shown right side up, rather than upside-down . . . as I feel that the intended effect of transistors marching in crisp unison into a sharply defined rose-colored future is lost by the diffused reflection in the mirror. . . Please don't interpret my comments on this photo as being negative on the magazine or its staff. It isn't.

John Markovics
Poughkeepsie, N. Y.

(Editor's note: The photo is just an art pattern; no up, no down.)

What about the one in England?

I have just seen the January-February *Think* which contains "Fastest 25 Years." I enjoyed the article and learned from it.

You could, and probably will, get lots of argument concerning your statement about the conception of stored program on the first page of the article. The statement on page 4, however, alleviates the situation, except that it does not mention what I believe to be the first working stored program calculator; namely, the one [EDSAC] which Professor Wilkes built at Cambridge University. . .

The so-called First International Conference on the History of Computing will be held at Los Alamos June 10-15, 1976, and I have been asked to review IBM History. Your article will help me.

Cuthbert C. Hurd
Portola Valley, Calif.

Wrong figure

In your recent article, "Fastest 25 Years" [Jan./Feb. '76], you presented an interesting and very well illustrated history of the computer age. However, on page 21 where storage devices are discussed, there is an error of large magnitude. In reference to magnetic disks, the article points out that today we can store 4,040 bits of data per square inch. This is not correct. The IBM 3330, which is the disk being referred to, records data at a density of 4,040 bits per *linear* inch around a cylindrical data track. There are approximately 370 of these data tracks per inch along the radius of the disk cylinder. Therefore, the density of data stored per square inch is actually almost 1½ million bits. . .

Please keep up the good work with *Think.* It contains the best written, most timely, and best edited material that I read.

John R. Patrick
Wayne, Pa.

(Editor's note: Wrong figure. Wrong source.)

What about the other eagle?

I just received the following note from an acquaintance of mine who is distressed by a statement in the "In Brief" section of the Jan./Feb. *Think,* to the effect that the Bald Eagle is the only eagle native to America:

"How could they do it to me? It's bad enough that my cousin, Baldy, was chosen as the national bird rather than me; to be totally forgotten in the bargain is humiliating. Don't they know I'm the other eagle native to America? Just because I'm indigenous to the Old World (and Africa, too), as well as the New, is no reason to ignore me. As a matter of fact, I'm far more numerous today than cousin Baldy. Too few Americans have ever seen an eagle—but if they have, the odds are that they saw me, not a Bald Eagle. Give your editor friend the bird for me.

(Signed)
"Goldy *Aquila Chrysaëtos* (The Golden Eagle)."

Knowing Goldy, he'd probably be mollified by a printed retraction.

Edward T. Buhl
Armonk, N. Y.

(Editor's note: We should have said "strictly indigenous" to America—not found anywhere else.)

What happened to IRD?

The January/February 1976 *Think* Magazine article, "What A Year," on 1975's divisional marketing performances might well be described by IRD's 386 sales and administrative personnel as "What A Blow"!

It is discouraging . . . that you could be so insensitive and uninformed to publish such an article with no reference whatsoever to IRD's fine record in 1975. . . There are numerous examples of IRD personnel who worked aggressively and determinedly . . . to contribute to one of IRD's most successful years in history.

E. F. Mosner
Princeton, N.J.

(Editor's note: You're right. *See page 49)*

Let's share the credit

In your recent article on the Indochina Refugee Project ["New Land, New Homes," Jan./Feb., 1976], the significant contributions of George Lefelar and Munson Hinman unfortunately were overlooked. George Lefelar, consulting systems engineer for National Federal Marketing in Bethesda, was our lead SE. He defined task force requirements and coordinated the selection, testing, and complete implementation of the refugee data base system.

Munson Hinman, advisory industry development analyst in Palo Alto, used his strong knowledge of the Interactive Query and Report Processor (IQRP) to quickly develop and teach courses to Government and volunteer Agency users on getting results from the new system.

Their creative use of standard IBM software packages—IQRP, Display Management System (DMS), and Customer Information Control System (CICS)—gave the Government a flexible, easy-to-use refugee placement system in less than three weeks. After the system was running at all locations, they spent the summer tailoring it to meet changing and increasingly more complex user needs.

The standard of excellence set by these two IBMers and our technical manager, Pat O'Brien, led to the success outlined in your article, and earned them each DPD's Achievement '75 Award.

M. S. Doré
Bethesda, Md.

Great for students

As an instructor of data processing at Colorado State University, I was intrigued by the center section of the January/February issue of *Think,* entitled "Fastest 25 Years." This section would be an excellent introduction to computers for beginning students.

D. Stacy Plemmons
Fort Collins, Colo.

Nice centerfold

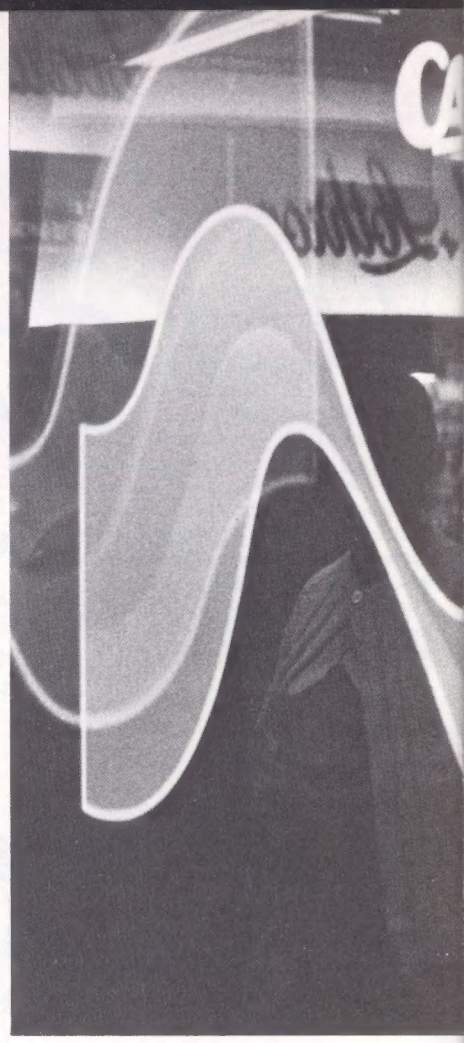
The centerfold in the January/February 1976 issue of *Think* is magnificent!

I am currently participating in the IBM Faculty Loan Program as a visiting professor at Pan American University. Amongst other activities, I am teaching three sections of the course, "Introduction to Computers in Business." I am quite anxious to distribute "Fastest 25 Years" to each student who is taking the course with me.

Barry F. Kunkle
Edinburg, Texas

Think welcomes letters from its readers. It reserves the right to print them all or in part. Write to:
The Editor
***Think* Magazine**
7-11 South Broadway
White Plains, N.Y. 10601

BANKING GOES RETAIL



How terminals help make it pay

by Richard Bode

One of the more intriguing electronic devices inside the Pentagon today has nothing to do with national defense.

It is an IBM 3614 automated teller, and it has been installed by Virginia National Bank on the main concourse of the famous five-sided building, where it has attracted new depositors from among star-studded generals and civilian clerks.

The Pentagon installation is only one of ten automated tellers that Virginia National (the largest bank in the state and 57th largest in the nation) has scattered throughout northern Virginia at branch bank sites. Two additional locations, installed but unopened (pending changes in state banking regulations), are in an apartment complex and in a shopping center mall.

All ten introduced so far are thriving. The one inside the Pentagon, for example, handled 6,000 transactions all by itself during the month of February. All ten are now handling about 20,000 transactions a month—with the number of transactions rising all the time.

"The single most encouraging thing about an automated teller," says David A. O'Connor, Virginia National's senior vice president, "is that customers perceive it as a kind of bank. They use the machine for deposits and withdrawals, and for transferring funds between savings and checking accounts, for inquiring into their balances—even for paying bills."

O'Connor says by the end of 1976 the bank plans to have 32 IBM automated tellers scattered throughout the state. Eventually, the bank hopes to operate more than 200 such machines, all of them on-line to one of three System/370 computers at its headquarters in Norfolk.

The automated teller is part of the coming world of electronic funds transfer (EFT), which has become a byword in the banking industry. In that world, funds will be transferred and accounts debited and credited electronically without the exchange of paper checks or cash.

How fast will EFT come and how far will it go? The general consensus among bank executives is that total electronic banking is still a long way off. But the feeling is that electronic transfers will play an increasingly major role in the nation's banking system with each passing year.

IBM has already made a commitment to that future with the introduction of its 3600 Finance Communications System—a family of terminals (abetted by controllers and software) that can add up to one-stop banking for the individual depositor.

"With its new Finance Communications System," says IBM Chairman Frank T. Cary, "IBM hopes to serve both the banking community and the individual bank customer at the same time. The terminals will help financial institutions reach out and attract the capital they need to maintain a strong financial system and a healthy economy. In addition, the terminals will enable individual depositors to handle their money in new ways and have greater access to it than ever before."

The IBM 3600 consists basically of three distinct terminals:

- The automated teller machine, a free-standing push-button device activated by a magnetically encoded plastic card issued to depositors;
- A small, handsome terminal with keyboard and video screen used by tellers at conventional work stations inside the financial institution;
- A point-of-sale terminal for department stores, supermarkets and other retail outlets that, in addition to check guarantee and credit authorization, can also perform all other customer banking services.

The automated teller phenomenon is hardly limited to Virginia, although state legislation recently adopted there is more conducive to state-wide branch banking than regulations in some other states. State laws that govern branch banking are

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Richard Bode, a freelance, writes frequently about finance, economics, technology, business, and science.

On the Pentagon's busy main concourse, a Virginia National Bank customer finds a quiet, private refuge within the special oak-panelled enclosure the bank built to house its IBM *3614 automated teller machine.*

changing rapidly, and the expectation is that most states will continue to ease restrictions so that banks will be able to compete more vigorously for consumer deposits than heretofore. Thrift institutions such as savings and loans and mutual savings banks are governed by the Federal Home Loan Bank Board, and generally have more liberal rules regarding establishment of branches.

"There are 14,000 commercial banks in the country," says John Bishop, Data Processing Division director of finance industry marketing, "and hundreds of them have either tested or installed some 4,000 automated teller machines sold by a variety of manufacturers." Bishop says that most automated tellers, when first installed, were off-line machines not produced by IBM. A fair number of these off-line machines are being converted to on-line terminals now. Bishop adds that there are, in addition, about 5,100 savings and loan associations, plus about 500 mutual savings banks. A large share of them are also prospects for the IBM 3600 Financial Communications System, which the company started to deliver to its customers in September 1974.

Industry consultants' opinions vary widely on the total number of automated teller machines to be installed by 1983 (for all manufacturers), ranging from a high of 75,000 down to 25,000.

"The business," Bishop says, "isn't limited to large financial institutions. About half the banks that have installed EFT equipment have less than $100-million in deposits. That puts them in the intermediate to small size." But he notes that for IBM the competition is keen. In automated tellers, IBM competes with NCR, Burroughs, Docutel, Mosler, Diebold, TRW, and Le Febure (a French company), to name a few. In point-of-sale terminals, some of the competition includes AT&T, Texas Instruments, Burroughs, NCR, TRW, Amcat, Datatrol, Elcom, and Concord.

At first blush one might assume that banks are rushing into EFT to bring about a checkless society to save themselves the problem of processing endless pieces of paper each day. That's only partly true.

"We're not talking so much about a checkless society as a less-check society," says Russell F. Pound, Jr., senior vice president at Connecticut's Hartford National Bank. "And even the notion of less checks is misleading. If anything, with banks offering free checking accounts, the number of checks written will continue to increase for at least another decade, and maybe longer." Pound says that 28 billion checks were written in 1974, and he expects—along with most bankers—the number to soar to 46 billion by 1980.

The rising tide of paperwork is important for a bank like Hartford National, which not only processes its own checks, but also checks deposited at 85 correspondent banks. Each day, Hartford National flies planes to a half-dozen cities in the Northeast to pick up checks from banks it serves, so that it can process them as rapidly as possible.

To expedite check processing and help reduce errors, the bank recently installed three IBM 3890 document processors, which read magnetically encoded checks and sort them according to their destinations—the banks against which they are drawn. The processors are operated by a

Instead of passbooks, customers of Hollywood Federal Savings and Loan Association in Florida use plastic cards for deposits, withdrawals, even payment of bills. Gretchen Felsell operates one of the IBM *3600 teller terminals that the bank installed at 105 work stations to make banking faster and simpler for its customers.*

System/370 and controlled by an IBM program product called Check Processing Control System.

James Galvin, assistant vice president and manager of the proof and transit department at Hartford National Bank, notes that the objective is to reduce "float" —that is, the time it takes to return a check to the bank against which it is drawn and debit the proper account. "A few years ago," he says, "60 percent of the checks were cleared in one day. Today 80 percent of the checks are cleared in one day. The longer it takes to clear a check, the less money a bank has at its disposal. And the more money it has on hand at any given time, the stronger its financial position."

Obviously, in a totally electronic banking system, float would be negligible, if not nil, because there would be no checks, only instant on-line credits and debits recorded electronically against accounts.

"It's quite true," says Frank S. Craig, Jr., president and chief executive officer of Fidelity National Bank in Baton Rouge, La., "that banks hope to reduce their paperwork load, or at least keep it from getting out of hand." But Craig believes we must look more deeply into the changing banking environment to understand the push toward electronic banking.

"Banking," he says, "has been changing since the 1960s, but the rate of change seems to be accelerating—especially in the past two years." Undoubtedly the most dramatic change cited by bankers like Craig has occurred in the source of bank funds. In the past, banks relied mainly on corporate deposits, less so on individual deposits.

"But corporate treasurers," says Craig, "have been sharpening their pencils. Today, partly as the result of the recent economic crunch, they work their money much closer than ever before. They don't leave large unused balances on deposit with banks. They invest money in places where it can earn higher rates of return, even if only for a few days."

Industry statistics bear Craig out. The American Banking Association reports that in 1975, for the first time in the nation's commercial banking system, individual deposits surpassed government and corporate deposits combined. "We're talking now," says Craig, "about attracting retail customers by offering them additional services. That brings us into the world of electronic funds transfer, which gives the individual customer a more convenient way to handle his money."

To compete for local deposits, Fidelity National (an intermediate size bank with assets of $300-million) installed six IBM on-line automated tellers at branches in East Baton Rouge Parish. On one February weekend alone, those six machines handled 3,300 separate transactions.

"The automated teller," says Craig, "can provide the same service as a live teller—except the automated teller works 24 hours a day, seven days a week. But what we like most is that depositors don't view the automated terminal as a mere cash-dispensing machine. In fact, deposits have continually outstripped withdrawals. That, of course, is what we want."

Craig finds customer acceptance of the automated teller has been high. He cites the example of a customer who uses the automated teller in the lobby of the bank's headquarters in downtown Baton Rouge nearly every day. "That customer," Craig says, "always uses the automated teller even though there may be no lines at any of the windows with live tellers. More and more we find people doing that."

One of the main advantages of the automated teller is that it enables banks to bring new and more services to customers without incurring the prohibitive expense of building a new branch.

"We've been chasing the customer all over the geography," says O'Connor at Virginia National. "We've been building branches in the suburbs, wherever there is a concentration of people, trying to get our share of the market." He says that branch banking is costly both in terms of brick and mortar and additional personnel. "But," he adds, "if we can extend our delivery system with automated tellers or point-of-sale devices in supermarkets—well, that's something else again."

In extending the bank's "delivery system" to customers, O'Connor means two specific things: "First, our objective has been to increase our consumer base—the number of customer accounts. Second, our goal is to increase the number of accounts held by an individual customer."

O'Connor points out that the profitability of a small checking account is questionable. "But if we can get the customer to add a savings account, then establish a credit relationship, then add a ready-reserve feature, and ultimately let

us pay his bills for him—then that customer account becomes profitable."

A marketing man with fresh ideas, O'Connor is among the new breed of professional managers rising to responsible positions in many banks. He sees in electronic funds transfer a way of encouraging customers to use more bank services. The marketing concept he introduced at Virginia National is called "Cash-Flow."

"With Cash-Flow, the checking account becomes a system," he says. "It's no longer an account in which funds rest. It's an account through which funds flow."

To open a Cash-Flow account, the customer must first obtain a magnetically encoded plastic card. The card activates the teller machine or the IBM point-of-sale devices that the bank plans to begin installing in supermarkets and department stores this spring.

Imagine the options open to a Virginia National customer who approaches the automated teller in the Pentagon with a Cash-Flow card and a paycheck received moments earlier.

By inserting the card and pressing the proper buttons, the customer can deposit half the check in his savings account and half in his checking account. He can withdraw up to $100 in cash. He can transfer funds to an account opened by his daughter, a college student in another part of the state. He can authorize the bank to pay certain outstanding bills. And he can obtain current balances for all his accounts.

All these transactions are conducted in privacy (the bank has designed a special oak-panelled environment for the teller) and take perhaps 30 seconds to complete.

A similar concept also exists at Fidelity National, built around the ABBY (Anytime Banking Benefits You) Card. Interestingly, when Craig refers to his automated tellers, he doesn't call them IBM machines or automated tellers at all. He calls them "ABBY machines."

Currently, Fidelity has no immediate plans to install point-of-sale devices. But

(Continued on page 55)

Banking abroad

How it adds up

Electronic funds transfer may be just gaining a foothold in the United States. But as a way of banking it is already deeply entrenched in many other nations of the industrial world.

Why does the U.S. lag behind Europe, Canada, the Far East, and even Africa in electronic banking? Mainly for two reasons:

First, commercial banks elsewhere are national entities with innumerable branches. In the U.S., for example, there are 14,000 commercial banks confined to state boundaries. In Canada, on the other hand, the people are served mainly by five large banks with branches from coast to coast.

Second, the method of paying bills in most other nations differs somewhat from the U.S. In the U.S., an individual usually pays a bill with a check that laboriously works its way back to the bank account against which it is drawn. In many other countries, the individual may pay by check or frequently may pay a bill by authorizing the bank to debit his account and transfer funds to the creditor's account at the same bank or another bank. Thus, many payments are made by banks simply by transferring debits and credits —a system that lends itself to on-line data communications.

Interestingly, of the 500 largest banks in the world, only 147 are in the U.S., while 232 are in the area served by IBM's Europe/MiddleEast/Africa company, and 121 in the area served by IBM's Americas/Far East company.

Equally interesting, the United Building Society in the Union of South Africa has the largest installation of IBM 3600 teller terminals—enough to equip 680 work stations in all. The Society, which issues savings accounts and home mortgages, reports that its terminals handle about 2.5 million transactions a month.

Lloyds Bank in England was among the first banks anywhere to put IBM terminals in supermarkets and department stores. The general public currently has access to 587 IBM 2894 cash-issuing terminals as part of the bank's "Cashpoint" system. The bank has also ordered 100 IBM 3614 automated teller machines. In its back offices, Lloyds has more than 1,800 IBM 3982 terminals linked to three major computer centers equipped with System/370 Model 168 computers. Currently, Lloyds is installing the first of the 350 IBM work stations it has on order.

"Bankers outside the United States have been customer-oriented for quite some time," says Richard Barber, director of the IBM Finance Industry Center in London. "The trend shows no sign of slowing. They realize that on-line computer networks mean better service for customers and more efficient staffs."

In Canada, all five large national banks use IBM equipment. The Bank of Nova Scotia, for example, has 900 branches, and the Toronto Dominion Bank, 850 branches. Together, they have more than 2,500 IBM 3600s on order.

The developing countries of Latin America are also excellent markets for IBM banking terminals. Banco Comercial de Mexico (Commerex), with 48 branches in Mexico City, will install more than one hundred 3600s and, on a trial basis, several IBM automated teller machines.

In Venezuela, Banco del Caribe is installing IBM 3600 teller terminals, and Banco Mercantil y Agricola already has 64 IBM 2970 terminals. A/FE marketing reps in Caracas report that Venezuela has excellent growth potential for IBM banking terminals.

Without a doubt, however, the hottest spot in international banking is Japan. Japan has 22 of the 100 largest banks in the world.

Takugin, one of the largest banks in Japan, now has 1,200 IBM terminals, including 300 IBM 3600 teller terminals. Takugin plans to install more IBM 3600s, which means it will outstrip South Africa's United Building Society.

Fukuoka Bank, a smaller bank in northern Japan, plans to equip some of its teller work stations with IBM 3600 terminals.

Japan had cash-issuing terminals long before most other nations—virtually all of them produced by Japanese companies.

"Japan's banking system has been on-line since the early 1960s," says Tatsuyuki Saeki, manager of finance industry marketing for A/FE. "Banking," he adds, "is A/FE's fastest growing industry sector, and, within A/FE, Japan is clearly the pacesetter."

AFRICA NOTEBOOK

For an old continent, new life. How IBM is fitting in.

by Ed Grimm

It was three o'clock in the afternoon of February 9 when the jet aircraft touched down at Abidjan Airport. Moments later, its passengers stepped out into the sunny warmth of the Ivory Coast afternoon. Their two weeks in Africa had begun.

The arrivals included IBM *Chairman Frank T. Cary, Vice Chairman Gilbert E. Jones, Vice President and General Counsel Nicholas deB. Katzenbach, and Jane C. Pfeiffer, former* IBM *vice president of communications and now a consultant to* IBM. *With them, from Paris, were Jacques G. Maisonrouge,* IBM *senior vice president and chairman of the board of* IBM *World Trade Europe/Middle East/Africa Corp., and Gerard Lefort,* IBM *Europe general manager for Africa and the Middle East.*

The trip was the latest in the stepped-up schedule of executive visits to IBM *country organizations outside the U. S. Last year, among them, the three-man Corporate Office of Cary, Jones, and* IBM *President John R. Opel visited 12 countries. The trips reflect the increased importance of* IBM*'s activities overseas.*

For Africa, the heady days of early independence are over. The days now are overcast with problems, too few of them yielding to overnight solutions. Twenty-three of Africa's 49 countries are rated among the world's poorest. There are shortages of skills, capital, industry, agriculture, and, in some countries, a lack of political stability. But Africa is too busy working at its problems to brood over them. And maybe because the continent's people are so young—one of every two Africans is under 15—the mood remains one of hope.

IBM's visiting executives came to appreciate and know that mood well during their two-week trip to Africa this February. Splitting up into separate groups, they covered IBM locations in Ghana, Zambia, the Ivory Coast, and South Africa. They met with heads of state and with ambassadors; government ministers and businessmen; in South Africa, with other political leaders as well, and with black homelands chiefs. At Family Dinners, they talked with IBM employees, their husbands and wives. At IBM installations, they conferred with customers.

"Wherever we went," says IBM Chairman Frank T. Cary, "the thing that impressed us most was the way our people are fitting the business into their environments and, in very special ways, using the skills and talents of the company in support of their nations.

"We aren't trying to fit our operations in every country into a predetermined mold. Instead, we're harmonizing with the needs of each country. This was what I was most pleased to find."

There is, of course, no shortage of problems. The average annual rate of growth for Africa's countries is only 5 percent. The continent accounts for only 5 percent of the world's trade. Its population is 80 percent rural, and subsistence farming has been ravaged by drought in many countries. The worldwide economic slump has reduced the earnings from African exports and often pegged the cost of imports punitively high. Those imports include food. The diet of Africans is protein-poor, and now they must spend three-fourths of their income on food. Finally, there is continuing political and racial strife in places such as Rhodesia and Angola.

In black Africa, there are urgent needs for a diversified economy, infrastructure, and efficiency in government. It's no accident, therefore, that so many national governments are turning to data processing to help them manage their affairs and assist in economic planning.

Some cases in point:

- In Cameroon, an IBM System/360 Model 40 handles customs operations, which account for 90 percent of that country's income.
- In the Ivory Coast, a System/370 Model 125 with the Department of Social Security maintains records and payments of pensions and illness claims.
- In Ghana, a System/370 Model 135 with the Social Security and National Insurance Trust handles all the accounting for that nation's new social security program; and a System/360 Model 30 at the Central Bureau of Statistics provides the government with a statistical profile of the country's economy, especially the private sector.

Some IBM installations in black Africa are as sophisticated as any in Europe or the United States. Others are small-scale, basic. Need dictates the difference. Zambia, for example, has decided it needs a System/370 Model 125 for its railway operations, but only a System/3 for its airways.

"These countries," says Cary, "are tackling their problems in a realistic way. They use the equipment they have efficiently and well. There's no tendency to get the latest and the best just because it's prestigious to have it.

"There's a great awareness of the need for productivity—not so much in the labor-saving sense but in being able to maintain competitive costs and prices."

Zambia, which accounts for three-fourths of IBM's business in the East Africa District, leads the way in advanced applications. Foremost among them are Model 158 installations with the national copper mines. Among their tasks: research, surveys, stores control, cash flow and sales analysis, and control of vehicles used in open cast mining.

Both Zambia and Ghana have learned the hard way that it is dangerous to rely too heavily on one product, no matter how predominant.

For years, cocoa has been king in Ghana. The country leads the world in its

ALGERIA
MAURITANIA
MALI
NIGER
CHAD
Khartoum
SUDAN
GUINEA
Conakry
UPPER VOLTA
BENIN
NIGERIA
Ndjamena
Freetown
GHANA
IVORY COAST
TOGO
Monrovia
LIBERIA
Abidjan
Accra
Lagos
CAMEROON
CENTRAL AFRICAN REPUBLIC
Bangui
EQUATORIAL GUINEA
Douala
Yaounde
UGANDA
Libreville
GABON
CONGO
Port Gentil
Moanda
Franceville
ZAIRE
RWANDA
Brazzaville
BURUNDI
Pointe-Noire
Kinshasa
TANZANIA
Luanda
Lubumbas
Kitwe
Ndola
ANGOLA
ZAMBIA
Lusaka
Livingstone
RHODESIA
NAMIBIA
MOZAMBIQU
BOTSWANA
Lourenco Marqu
Soweto
Pretoria
Mafeking
Johannesburg
Chamdor
SWAZILAND
Ulundi
LESOTHO
Durban
SOUTH AFRICA
Cape Town
Port Elizabeth
LEGEND
IBM and Customer Locations

Above: Copper is king in Zambia, accounting for 30 percent of the Gross Domestic Product. This smelter is at Kitwe, a major city in Zambia's Copper Belt, which runs north into Zaire. With the decline in world copper prices, Zambia has been forced to diversify its mining to include coal, zinc, and lead.

More than 1,300,000 tons of cargo are handled at Ghana's port of Tema each year. Between them, Tema and Takoradi Harbor on Ghana's west coast are visited by ships of more than 23 nations. Ghana's exports are timber, industrial diamonds, and, above all, cocoa (350,000 tons a year).

Above: At employee meeting in Abidjan, IBM Chairman Frank T. Cary introduces Mrs. Cary to Honest Wadjas, office manager. At rear is Jacques G. Maisonrouge, IBM senior vice president and C.M.C.'s chairman.

Right: At a family reception in Ivory Coast, IBM Vice Chairman Gilbert E. Jones and Mrs. Jones meet systems engineer Kouame Assouan, second from left, and Mrs. Tah, wife of a customer engineer.

In Abidjan: Jacques Maisonrouge talks with Ivory Coast IBM employees: François Ilory, data center services supervisor; Honest Wadjas, Marxent Bla, secretary; and Dho Aboli, customer engineer.

Student at Dlaka School in Umlazi Township receives gift from Lucy C. Pfeiffer during a previous trip to South Africa. Dlaka School has received funds and equipment from IBM South Africa and its employees.

production and derives 70 percent of its export earnings from the crop. When the world price for cocoa went into a nosedive recently, so did the Ghanaian economy. Now the nation is burdened by a balance of payments deficit and a 25 percent inflationary increase in prices.

What cocoa is to Ghana, copper is to Zambia: nearly 30 percent of its Gross Domestic Product and 97 percent of its exports. For several years, copper had propelled Zambia to the forefront of black African progress. Now the world price for copper has plummeted 40 percent, severely slowing down the Zambian economy.

Both countries are now, belatedly yet determinedly, working hard to diversify in their agricultural and industrial planning. And IBM equipment in both industry and government is aiding the process.

If Africa's new nations are to succeed, they must come to rely less on outside help. One economist has likened their status to a driving student in a dual-control car: Sooner or later, he must take to the road alone. So far as IBM is involved, this is the goal of the company's Africanization program.

The program seeks to reduce the number of European assignees in black African countries so that by 1980 at least 90 percent of the employee population will be national. Right now, it's 75 percent, and progress has been steady.

Nationals recently have been chosen as country managers in Tunisia and Morocco. Zambia now has only 17 European assignees in its work force of 87, and the company is led by a Zambian, Valentine Musakanya. Ghana's 46 employees are all Ghanaian, including Julian Fummey, who has been country manager since 1969. In the Ivory Coast, which maintains close ties with France and is French-speaking, progress has been slower but the pace is picking up.

"'We are focusing on turning people into experts," says one IBM manager involved in education, "because Africa's problems are more and more complex. And this is true whether they pertain to tax revenues, labor legislation, treasury operations, or industrial planning."

The Africanization program applies to all IBM functions—especially administration, and customer and systems engineering. But nowhere is its emphasis greater than in management development.

The company's education effort in black Africa transcends its own needs. This wider commitment dates back to 1964 and the opening of the African Education Center at the University of Ibadan in Nigeria. Hundreds of African students

Black Africa's governments rely on data processing to handle everything from economic planning to social security payments. This installation is at Abidjan in the Ivory Coast.

who completed courses in computer science and business management there went back to help build the infrastructures of their own countries. Today, IBM conducts a program of fellowships, scholarships, and two-year sabbaticals for European employees to go to countries like Zaire and Nigeria and help establish data processing courses in university and government departments.

In southern Africa, too, there is a shortage of skilled manpower; but few shortages of natural wealth. Fisheries, extensive crop and pasture lands, hydroelectric power, every important mineral—they're all there in abundance.

Most prosperous of all the countries is South Africa, a nation of 25 million people and ranked as one of the world's 20 leading industrial nations. Its annual production of more than 60 minerals—gold foremost among them—is estimated at $6-billion.

Unlike the rest of Africa, the economy of South Africa pivots on the manufacturing industry, which accounts for 27 percent of the Gross Domestic Product. It has recently developed a nuclear energy industry, and possesses one-fourth of the world's uranium reserves.

IBM has been in South Africa for 24 years, and its operations there are extensive. The company has a headquarters and education facilities in Johannesburg—as well as card plants in Johannesburg and Cape Town. There are also branch offices in Cape Town, Durban, Pretoria, and Port Elizabeth.

Roughly two-thirds of IBM's business is with the private sector and one-third with the government. Major systems customers include South African Airways, the Uni-

With a population of 1.5 million, Johannesburg is South Africa's largest city and commercial center. Because of its vast, diversified mineral wealth, South Africa ranks among the world's 20 leading industrial nations.

versity of the Witwatersrand, the Anglo-American Corporation, the Johannesburg Stock Exchange, and the United Building Society—a savings and loan bank that has installed the first and largest IBM 3600 system in the world. There are also major international accounts such as General Motors, Mobil Oil, Colgate-Palmolive, and Kodak.

But the economic picture of both South Africa and the southern region is clouded by racial and ethnic conflict. And the differences that have developed among these nations underscore how economically interdependent they are. Seven of the region's nations are landlocked, dependent upon their neighbors for access to the sea. Two of them, Zambia and Rhodesia, find themselves especially vulnerable to the disruption of railway networks so vital to their trade.

In the words of Zambia's President Kenneth Kaunda, political independence without economic prosperity is like being "a one-legged nation in a two-legged world." So slowly, haltingly, the nations of Africa are beginning to work and plan together.

The Economic Community of West Africa is spurring trade among its 15 member nations and encouraging associations of raw material producers. In the north, Sudan and Egypt are jointly developing a 180-mile canal that will bring more than 2 million acres of land under cultivation. Negotiations with the European Economic Community have brought about an opening up of EEC markets and the promise of substantial economic development aid over the next five years. World Bank loans are expected to ease the food shortage.

Africa today is a continent that invites yet defies oversimplification. It resists clichés like "the winds of change" and "the Dark Continent." But those winds still blow, and much of the continent is still obscured by myth and misconception. Most insights and answers come only from firsthand observation, which is why IBM management made this February's journey.

Back at Armonk Headquarters, Frank Cary takes stock of the Africa he saw during those two weeks. "It's a continent of many contrasts and tremendous potential," he says. "Right now, the great need is for political and economic stability. If they are able to take advantage of opportunities, they should be able to create that stability.

"And as the countries develop, we will develop with them. After seeing our operations in Africa, I really believe that we're in tune with the times." ■

Why IBM stays in South Africa

Some concerned groups and individuals have called for IBM to cease doing business with the South African Government or any of its agencies because of objections to the Government's racial policies. IBM believes this would be tantamount to withdrawing from the country; and that the company can accomplish more good by remaining in South Africa than by withdrawing.

The percentage of blacks employed by IBM South Africa has increased steadily from 4.2 percent in 1970 to 9.7 percent at the end of 1975. Today, 144 of 1,419 employees are black. A total of 192, or 13.5 percent of the work force, is nonwhite.

Blacks now work side by side with their white counterparts as computer operators. There are black trainees in computer programming, systems engineering, and account administration; others have begun careers in maintaining Data Processing and Office Products equipment.

There is an extensive employee development program for blacks. In 1975, approximately 8,500 days of training were provided to prepare them for new jobs or higher positions.

All employees receive equal pay for equal work. Blacks get all the employee benefits that whites do. In addition, they receive free medical aid and low-interest home improvement loans.

In 1975, IBM South Africa made contributions to various agencies assisting blacks. Much of this aid took the form of high school and university scholarships, particularly for black teacher training.

All sales of IBM equipment to the South African Government are in strict compliance with the U.S. Government's regulations.

Color art and photographs by: John Marmaras/The Chartmakers: 9. Shostal Associates: 10, 12 bottom. IBM Photos: 11. Mark and Evelyne Bernheim-Woodfin Camp and Associates: 12 top.

The rites of Spring

Corporate Awards

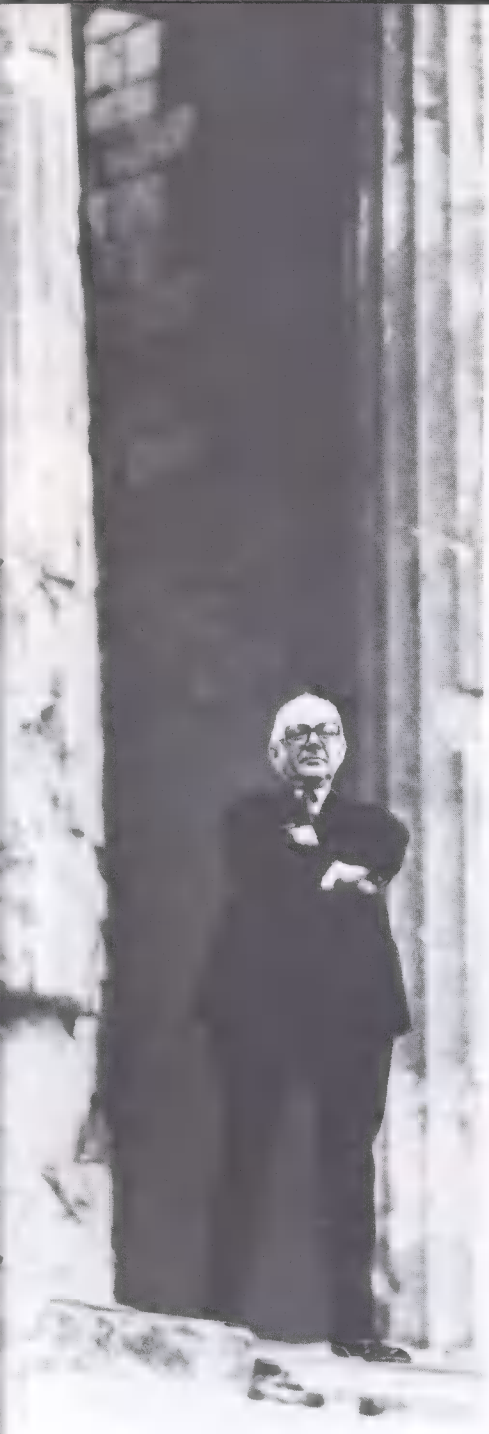
For Clay Johnson, the Spirit of '76—Nineteen-seventy-six, that is—soared to a springtime apogee on the evening of April 5. The event: the annual Corporate Recognition Dinner, attended by 156 IBM people who had been cited during 1975 for Outstanding Contributions and Outstanding Inventions.

The moment arrived in the baroque grand ballroom of the Waldorf-Astoria in New York City when IBM Chairman Frank T. Cary announced that Johnson, senior business planner for the General Products Division in Boulder, Colo., was the lone Corporate Award winner in the citations. He was recognized for his work as the primary architect on the Mass Storage System in Boulder.

What will he do with the $15,000? "We started remodeling our house last summer," he says, "and I was just thinking about where I was going to borrow some more money. Now I guess I won't have to."

In the tradition of the Corporate Awards ceremonies, four new IBM Fellows were named by Cary, from four disparate parts of the Corporation: Vienna, San Jose, Armonk, and Boulder. The new Fellows are:

• Dr. Heinz Zemanek founded the IBM laboratory in Vienna and built one of the first transistorized computers in Europe. "We had to use hearing-aid transistors," he recalls, "and we knew it wouldn't be a hurricane or a typhoon, so we nicknamed it *Mailüfterl,* a nice little Viennese 'May breeze.'" Dr. Zemanek's specialty has been programming language, which



Louis Pasteur once wrote: 'In the fields of observation, chance favors only the prepared mind.' One of the most powerful resources IBM draws upon for its leadership is *the prepared minds of our people.* Minds prepared to recognize quickly. To see the familiar in unexpected ways. To appreciate and evaluate. To reduce to practice. Whether in the areas of high technology. Or sophisticated administration . . . Or doing today's job better, in whatever way . . . Indeed, it's the prepared mind that is most often evident in the spectacular breakthroughs in human endeavor.

—IBM President John R. Opel
Keynote speaker
Corporate Recognition Dinner

Achievement of the highest order, that's what the Parthenon meant to the ancient Greeks, and that's why these four men were chosen IBM *Fellows (left to right): James Pomerene, Armonk; Carl Queener, Boulder; Dr. Edgar Codd, San Jose; and Dr. Heinz Zemanek, Vienna.*

For Clay Johnson it was a rewarding evening—of sum and substance.

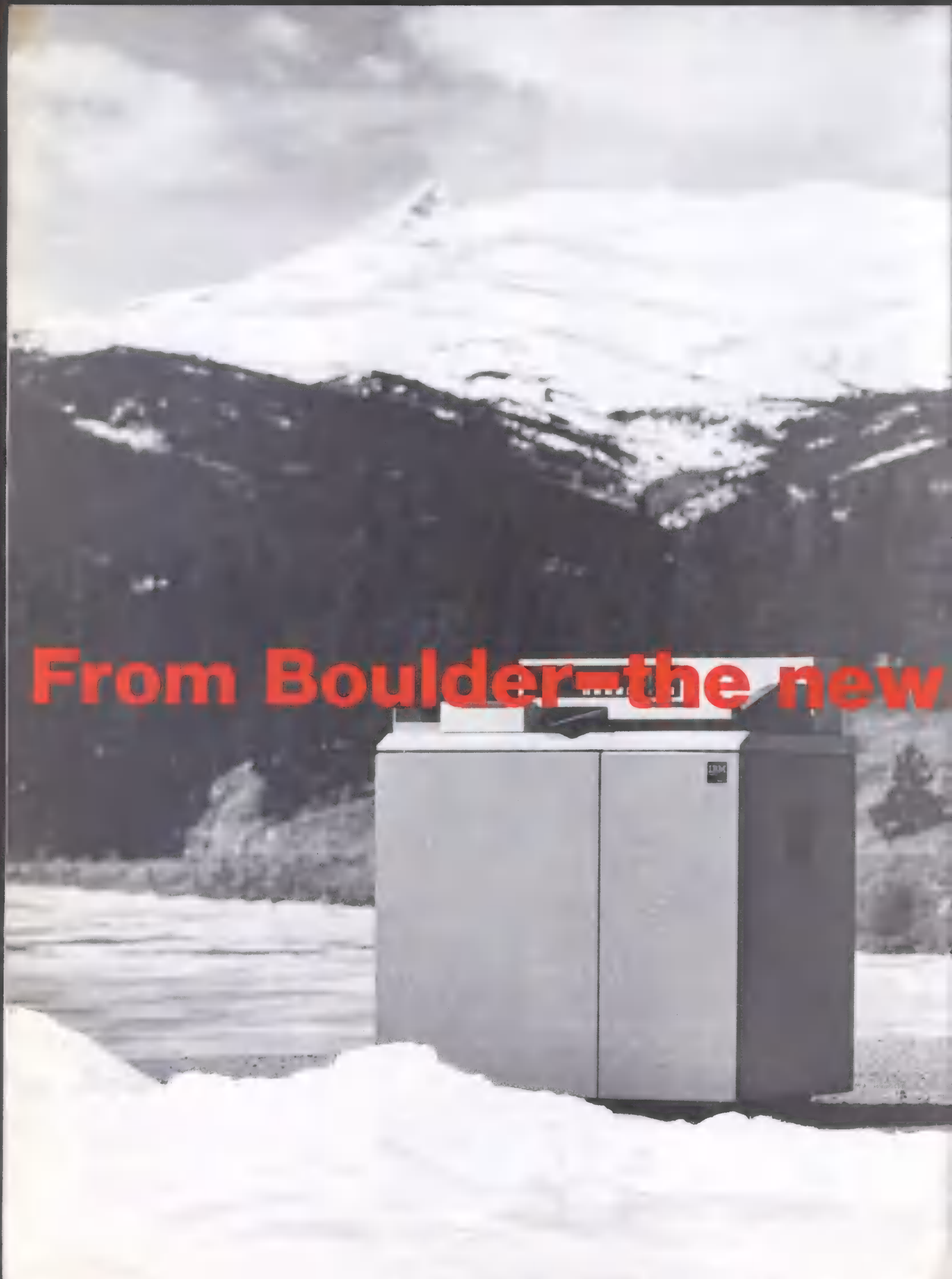
he plans to pursue during his Fellowship tenure. "Good architecture, good software design," he says, "that's my main interest at the moment."

▪ British-born (in the Channel-coast village of Portland) Dr. Edgar Codd is a research staff member at the IBM lab in San Jose. For his pioneering work in the organization of large computer data bases, his reputation is international. "I plan to continue my present work," he says, "in developing a natural language, front-end (English) to relational data base management systems. This will enable the casual user to comunicate—in a dialogue mode —with a data base."

• James Pomerene has been a member of the Corporate Technical Committee Staff in Armonk since 1967. His Fellowship, he says, will enable him to study the "technological aspects of large high-speed systems." Pomerene, who came to IBM in 1956 from the Institute for Advanced Study in Princeton, N.J., directed the design of IBM's Harvest computer, which was a major addition to the IBM STRETCH computer developed for the U.S. Government.

▪ Carl Queener was a key member (development engineering manager) of the IBM team in Boulder that designed and developed IBM's new Series III Copier line (*see story on page 16*). His Fellowship, he says, "came as a real surprise. Yessir! I've been very fortunate to be involved in a lot of things that have been fun—and worthwhile at the same time. I never did anything alone, though. I always had the help and cooperation of other people." His plans? "More Copier research."

To cap the evening, Cary announced a special IBM-funded award, a new international annual prize for information processing achievement. It will be awarded by the Institute of Electrical and Electronic Engineers, and consist of a cash prize of $2,000 and a grant of $2,500 for international travel. "To me the most gratifying thing of all," Cary said, "is that this distinguished new prize will be named the Emanuel R. Piore Award. I know everyone . . . throughout the IBM company welcomes this newest honor to our former Vice President and Chief Scientist, who over the years has won a special place in the affection and esteem of every one of us." ■


From Boulder—the new

'Everything Machine'

by Edward F. Pierce

It's fast—has a top speed of 75 copies per minute.

It "duplexes"—prints on both sides of copy paper; and the process is totally automatic.

It collates.

Its improved document feed can cope with all kinds of paper—from onionskin to card stock.

It can reduce an 11-by-14-inch computer printout to 8.5-by-11—and two letter-size originals to one letter-size copy.

And more.

It's IBM's new Series III Copier line, Models 10 and 20, which made its appearance on March 5, after an incubation period that began in its old Kentucky home in Lexington, and ended some 1,200 miles westward, at the foothills of the Rockies, just outside Boulder, Colo.

"Our latest step—the dramatically new Series III Copier—is our most ambitious yet," said Bart Stevens, president of the Office Products Division, at the Chicago announcement. "We have combined the convenience features of a copier with the speed of a duplicator to give most customers everything they need in one machine."

Doug Query, product manager, Copier, at the Boulder laboratory, says: "It probably represents the most significant product announcement ever made by OPD. I think the real story here is more than the product—the box itself. It's how far we've come with what we've had to work against in the marketplace. In the early Copier days we had a lot of skeptics, and many people thought we wouldn't make it; the factors against achieving our objective were overwhelming. But now I think everybody acknowledges that this is the best copying machine that's ever been announced—anywhere."

Doug Query's associates are quick to agree; they're an enthusiastic team, the group at Boulder. As Carl Queener, development engineering manager, says: "We've come up with an 'everything machine.' This one has all the bells and whistles—and it's three times as fast as Copier II."

Queener is referring to the sweeping technology changes in Series III. Among the innovations: a new, light-sensitive photoconductor was introduced; totally new forms of cleaning, illumination, and fusing systems were adopted; an improved, high-yield toner (the material that develops the image) was evolved. In addition to major changes in the electrophotographic process, automatic duplexing and major paper-handling improvements were developed—Series III uses cut sheets, not rolls of paper.

Many of these innovations were the result of developing the technology and running the machine program "in parallel," says Jim McDonald, manager of production engineering. "We did this because in some areas we weren't always sure that some of the things we were trying to do would be feasible in the long run. For this reason, we had backup programs in many areas. The engineers had to remain flexible because our priorities would shift as old problems were solved and new problems were identified. It was certainly a team effort under difficult circumstances. Everyone on the program can be proud of what was accomplished and the end result."

And what does the new line—the end result—inherit from its forebears, Copiers I and II? Reliability, the ability to produce top-quality copies, and a family resemblance in the external proportions. Under the skin, with its advanced technology, Series III is a new offshoot of the family tree.

"It's absolutely new," says Dick Deatrick, Boulder plant manager. "It's been a standing joke around here that we 'changed everything but the casters.' Well, even the casters have been changed. In fact, I'd say we've made a jump equivalent to the kind of jump System/360 made in data processing technology."

While the technology is sophisticated, the machines are simple to use:

- The operator just drops an original into the document feed—no buttons to push, the original is automatically positioned on the glass—and the first copy emerges 4.5 seconds later. Subsequent copies are

Major function changes in IBM Copiers

	Copier I (1970)	Copier II (1972)	Series III (1976)
Burst Speed (copies/min.)	10	25	75
Time to First Copy (sec.)	15	6	4.5
Unlimited Book Copying	No	Yes	Yes
Copying of Halftones and Solids	No	Yes	Yes
Duplexing	No	No	Yes (totally automatic)
Collation	No	No	Yes
Reduction	No	No	Yes
Document Feed	No	Yes	Yes (improved)
Letterheads and Special Applications	No	No	Yes
Paper Supply (No. of sheets)	600	600	2,700
Copy Selector	Mechanical	Mechanical	Push-button

turned out every 0.8 second, or 75 per minute.

- To clear any jamming or misfeeds, the operator simply checks three numbered areas that indicate where the trouble may lie, then presses a button to clear the machine. This is where the Series III memory bank comes in; it keeps track of the number of copies removed during a clearing process and automatically produces the requested number so that there's no need to re-dial a new quantity.
- The duplexing operation—making copies on both sides of the sheet—may be done on legal- or letter-size paper. This function is automatic, without any need for special maneuvers or intervention (which are necessary in competitive copying devices). Once a first side is copied, the sheets are routed by the machine to the duplex tray. When it's time to do the second side, these copies are fed back through the machine, and ultimately delivered to the exit tray.
- To get smaller, space-saving copies, the Model 20 of Series III can reduce size 26 or 35 percent: an 11-by-14-inch computer printout to 8.5-by-11 inches; a 12-by-17-inch document to 8.5-by-11.

"All these features add up to a machine where quality and reliability are watchwords," says Dave Mitchell, Boulder general manager. "We believe that the customer has a new level of expectation as far as the product is concerned. That is clearly our working Bible."

As in any undertaking of its scope and direction, the project has had its ups and downs. In planning, for example. "Everyone knew right from the start that Series III would be an exceptional product," says Flavil Van Dyke III, manager of Copier product plans and controls at Boulder. "As the product planners began to focus on design objectives, enthusiasm began to build up, and to this day it hasn't diminished. However, it's one thing to think up a 'super' machine concept, yet quite another to see it through to a profitable conclusion. Our efforts, therefore, took us through all kinds of strategic assessments—all for the first time on a worldwide basis." (For European customers the machines will be manufactured in the Berlin, West Germany, plant, which is managed by Gunther Preiss. Initially, Series III will be marketed overseas in Paris, France; Zurich, Switzerland; Düsseldorf, Frankfurt, and Munich, West Germany.)

One of the most complicated problems of the mission involved the move of a large number of people from Lexington to Boulder—right in the middle of Series III development—during the summer of '74. It was one of the largest transfers of

people and work load in IBM history. The Copier mission had outgrown the Lexington facility, and an IBM task force had been assigned to reconnoiter for more commodious accommodations—and Boulder got the nod.

As Dave Mitchell states: "We retrained Boulder people who had tape drive and Mass Storage System backgrounds, and brought them into Copier technology. This was not only necessary for the mission, but it was also a phase of the effort under way, as part of the company's full-employment practice."

Retraining was one thing; moving another. Ed Wyma, Copier production manager at Boulder, says: "A lot of us were apprehensive about how it would turn out. From an engineering standpoint, we were at the height of activity at the time we moved. People wanted to get their families settled here in Boulder, and at the same time wanted to spend as many hours as possible working out problems on the job.

"One of the ironic parts of the move was that most of us from Lexington were looking forward to the climate and environment of Colorado, which is great—very conducive to wanting to be outdoors—but nobody has had much time to enjoy it. It's been a very dynamic kind of situation, though, and everybody has responded and reacted extremely well. We've had a very successful transition."

Another thing that compounded the move to Boulder, according to Dick Deatrick, was a communications difference. "Those of us who came from Lexington spoke in terms of Copier technology, and the Boulder people spoke in terms of data processing technology. That is, most of the Lexington group came with mechanical expertise, and the Boulder people were strong in digital electronics.

"So it was a learning process for both sides. But we did learn from each other, and learned to understand each other. In all, it's been a good relationship. We expect very wide acceptance of the line, so we'll be put to the test again to meet the demands of the marketplace. But if you're going to have trouble, that's the nicest kind of trouble to have."

Waiting in the wings to meet and satisfy customer demands are the customer engineers who have been trained in the Boulder classroom and on the Series III assembly line, where the machines also get their final debugging. Says George Byrnes, customer engineering-technical operations manager: "This year alone hundreds of customer engineers and technical specialists are expected to be trained. Over the lifetime of the program we'll train thousands."

In addition to personal and on-the-job adjustments of the Series III mission, there were even environmental problems, according to Dick Harris, product test manager. "We're more than 5,000 feet above sea level here, so we had to buy an altitude chamber to test the machines. Altitude affects the electrostatics, and at very high altitudes you have static electricity that can build up to several thousand volts on the paper, and at times it affects the copying process.

"Another thing we look into is the human factors aspect, being very careful to determine how the machine is to be used by the casual operator, how clear the instructions are, the color of the buttons [they are predominantly blue and green], and so on."

Tandy Haggard, director of engineering at Boulder, sums it up for his Series III team mates: "What we came up with was a machine that has pretty much every feature that exists in copier machines today, only they're all under one set of covers, instead of one machine that does duplexing, another that does reduction, and so on. We have it all in one package. I guess what's impressed us most in this program is that it's the toughest job we've ever done in our division.

"Looking back on it all, particularly if you look at where we were in 1970, it's been worth it. In the development it had to be completely bootstrap. So the going has been rough at times, but the experience has put us in a position where we can stand tall." ■

At the March 5 announcement of Series III, IBM Chairman Frank T. Cary had nice words for the Boulder team's track record. "On an occasion like this," he told the group at the plant site, "I can't help thinking of the old saying about what a track team has to do if it wants to win the high jump. It doesn't go out and find seven people who can jump one foot. It goes out and gets one jumper who can jump seven feet. Well, here at Boulder, you found a lot of people who can jump seven feet, and that's why we're celebrating."

Cary went on: "As you know better than anybody, it took people to make advances like the Series III a reality—lots of people, people willing to relocate and change careers, people who can jump seven feet and better—in development, in manufacturing, and throughout the Office Products Division—people who in just five years have given IBM a great and growing beachhead in the highly competitive copier business."

The word from the marketplace

"An enhancement of—an addition to—our Copier line." That's how marketing views Series III, according to Jim Hastings, Copier product marketing manager at IBM's Office Products Headquarters in Franklin Lakes, N.J.

Copier II, he asserts, will continue strong. "Say you were to view the market as a ruler, from 1 inch to 12. Copiers I and II fit on the low end from 1 to 6, then Series III picks up at 7 and goes all the way to 12. So we're excited by this potential, and we think the marketing rep will be."

Another great advantage of Series III, says Hastings, is that it gives the sales reps far more effective utilization of their sales time. "If they have to walk out of sales calls because they don't have other products to offer, it's a waste of time. But now, with a variety of alternatives, they will be able to get more productivity out of their time—and the customer's as well.

"Some of our customers—or potential customers—don't need the speed and volume of Series III. Copier II is the answer for these customers; it makes one of the best copies in the business—photos, black-and-white, halftones."

In customer surveys, Hastings says, reliability is always singled out as an IBM hallmark. "As a consequence," he says, "I think a lot of manufacturers have improved their service. I believe that most customers get better service today because of the competitive activity. To keep a customer, he's got to be a happy one, not just one who has been impressed by speed or a product name. Our focus has been not on just selling a product, but selling a service that goes with it: engineering, sales, support—the whole works.

"We feel fortunate to have entered the copier business when we did. It gives us a chance to be innovative and do something exciting for the industry."

Part V IN THE SERIES ON BUSINESS AND HOW IT WORKS

Got the feeling that maybe government has too big a hand in your pocket?

That you're being crowded into a corner by more government than you want?

A great many Americans do. And politicians have picked up the scent. For almost the first time in recent history, government-baiting has become a popular pastime among candidates of both parties.

For those whose memories go back to a time when government was thought to hold the answers to most questions, the worm has turned. Today, even the "ins" spend almost as much time as the "outs" chastising government for what they think it should *not* be doing. Or, as *The Wall Street Journal* puts it: "This is the year when everyone is running against the government . . ."

This stump talk reflects a deeper questioning of the role of government in our lives by a broad segment of the public. So much so, that for a time, at least, beating up on government has eclipsed that other perennial diversion—beating up on big business.

A public opinion poll shows that now almost half the American people see "big government" as the major threat to their personal freedom. In that same poll, big business and big labor trail far behind. While many Americans fault both the latter for other reasons, at the very least they are out of the running in that particular context.

What's more, it's not only Washington that's taking the lumps. State governments, long forgotten, now share in the disenchantment. And mayors throughout the country no longer find themselves safe in City Hall. Constituents faced with rising taxes and declining municipal services are more and more demanding they get their money's worth.

The public's "annoyance index," as Dr. Walter Heller, President Kennedy's onetime economic adviser, puts it, has risen sharply because of what appears to be the mounting intrusion of government in our lives. And with almost one out of every five Americans on some sort of government payroll, little wonder that the other four are beginning to ask what he or she is doing there.

Granted that many Americans are uneasy about the growing scope of government, where do we go from here? "If you sent out a poll asking people if they want to cut down on Federal spending," says James T. Lynn, of the Office of Management and Budget, "probably 85 percent would say 'yes, cut it back.' " But the rub comes in what and where. Whose ox is being gored? And it's here that the consensus splinters.

In this fifth of its six-part series on "Business and How It Works," *Think* examines the role of government in our economy. Dr. Heller is interviewed on the complex and ever-changing relationship between the public and private sectors. And, stepping back from the current scene, author and newspaperman Max Lerner puts in historic perspective the not always placid marriage between politics and economics.

Not everyone will, or should, agree with their views. But the questions they raise offer a stimulating insight into the problems facing our system today.

Section edited by GEOFFREY D. AUSTRIAN and ROBERT J. SIEGEL

OUR MIXED ECONOMY

How much government in the mix?

SOUTHPORT
THE WALL STREET JOURNAL

An interview with Walter W. Heller
Chief economic adviser to President John F. Kennedy

OUR MIXED ECONOMY

Government and Business

Dr. Heller, what do economists mean when they say we have a "mixed" economy in this country?

Essentially, they mean that we have neither a controlled nor a free economy. It is, rather, a guided economy in which we rely fundamentally on the free market competitive system, but in which there is a lot of government regulation, government activity, and in some cases even a degree of government competition with the private sector. Additionally, government takes responsibility for a wide range of social services—for the old, the poor, the jobless, and so on.

Is that "mix" changing, with a larger proportion of government than there used to be?

Many conservative politicians try to give the impression that the mix is changing and that we are sliding down the socialist road—down Nobel economist F. A. Hayek's "road to serfdom." But I feel such a conclusion is very hard to back up. Even though the public's "annoyance index" has risen to a new high, there has been no comparable rise in the level of government activity and control of people's economic lives—especially at the Federal level.

What yardsticks do you prefer for measuring the government's size?

There are several measures. One is the amount of Federal spending as a portion of total spending in the economy, the Gross National Product.

And that ratio?

Federal outlays as a percentage of GNP averaged about 19 percent in the 1950s and 20 percent in the 1960s and would be about 20 percent if we were at full employment today. There's not much of a trend there. Twenty-five years ago state and local outlays equalled about 7½ percent of GNP; recently this spending has been running about 15 percent of GNP. That doubling, however, has come largely in the fields of education and local services.

But the economy, of course, is not operating anywhere near full-employment levels. What is the current ratio of Federal spending to actual GNP?

The ratio has edged up somewhat lately. In 1975, for instance, it reached about 24 percent. But the rise is a temporary one and is due to an unusual combination: the recession, which reduced GNP, and a spurt in government spending on programs designed to bolster people's incomes and reduce hardships on them resulting from the business slump.

What programs do you mean?

I am referring principally to unemployment compensation, Social Security, and welfare assistance. Such spending—along with tax cuts—helped to turn the economy around from its steepest decline in 40 years. And that's been the record throughout the postwar period. Recessions have been shorter and milder than they were in the 1930s. I think the record proves that spending and tax policies have been a major factor in making our economic system work better.

But haven't government payrolls climbed sharply?

Yes, total public payrolls have increased at a faster rate than private employment. But, again, that's been primarily due to fast-climbing state and local payrolls, which exceed 12 million workers; triple the number 25 years ago. That compares to 2.8 million Federal civilian employees, up just 20 percent in 25 years, while U.S. population was up 40 percent.

The thing to remember is that state and local government provides services close to the people—ranging from garbage collection and police to schools and road maintenance. Those are services we need in our daily lives. The Federal Government plays a different role—from national defense to interpretation of the Constitution. When people express alarm about the tentacles of government threatening to strangle them, I think most of them are thinking about Federal programs.

Quite aside from those spending ratios, doesn't the ordinary citizen have the feeling that government is looming larger in his or her life?

I would agree. Perhaps we should devise some sort of "intrusion" index. I think the impression is correct that government regulation to protect the consumer, to shield the environment, to provide for people's safety, for health—the whole gamut—is on the upswing.

Does that trend worry you?

I have mixed feelings. There is an obvious need for many of these "social" regulations to avoid abuses and protect the consumer. But just as obviously, there are areas where the government ought to "get out of our hair." I am encouraged by efforts in the Congress and the White House to reform regulation. Many outmoded and unnecessary regulations reduce economic efficiency and productivity and increase costs and prices.

Can you give some examples?

There are dozens. Import quotas. So-called "fair trade" laws which, happily, have now been abandoned. Ridiculous regulation of transportation, which goes back to the days when the railroads had no competition. The Davis-Bacon Act, which pushed up construction costs because it requires higher wages on Federal projects than would prevail if the market operated without interference. These and others boost costs, lower efficiency, and should be ended.

At President Ford's Economic Summit meeting in September of 1974, a group of us economists singled out 22 different kinds of regulations that are distorting the allocation of resources. Of course, it's easy to recommend an end to such programs; carrying through is much more difficult. You step on sensitive toes—especially of affected industries and unions—and there is plenty of opposition to deregulation.

Rate regulations, like import quotas and duties, often shield industries from the cold blasts of competition and lower prices. The railroads—and even the airlines—resist deregulation partly on this score. Unions bitterly oppose removal of the Davis-Bacon Act since it would threaten construction wages.

Coming back for a moment to public spending, what is your philosophy on what various levels of government should do?

Since my earliest days as a "LaFollette Progressive" in Wisconsin, I have been a believer in strong state-local government. Unless we have a reasonable balance of power and effectiveness, as between the Federal and state-local levels, we weaken our entire system of government. Essential to this balance is financial capacity at the state and local level to meet the needs of the people—fire and police protection, sanitation, schools, and so on. To help provide the money, I urged President Johnson in 1964—without success—to adopt a plan I had first put forward in 1957 for the Federal Government to share its revenues with states and localities. This was to be without strings attached, in order to preserve local independence. It remained for President Nixon to embrace the plan and get it enacted. All in all, revenue sharing has worked well, and it should be renewed when it expires this year.

What is meant by the government's "fiscal policy?"

Essentially, that term covers the use of Federal taxes and spending to help keep the economy functioning at or near desired levels. Taxes are raised or lowered, spending programs are enlarged or cut back, in an attempt to compensate for the ups and downs in the private economy.

But in actual practice isn't the Federal Government always applying stimulus—and in the process, running big budget deficits?

Unhappily, we have been running deficits in all but a handful of years since World War II. We are more willing to cut taxes and increase spending to spur the economy than we are to restrain spending and boost taxes to curb inflation. Nevertheless, the budget did swing toward restraint in 1969-70 and 1973, when the economy was overheated.

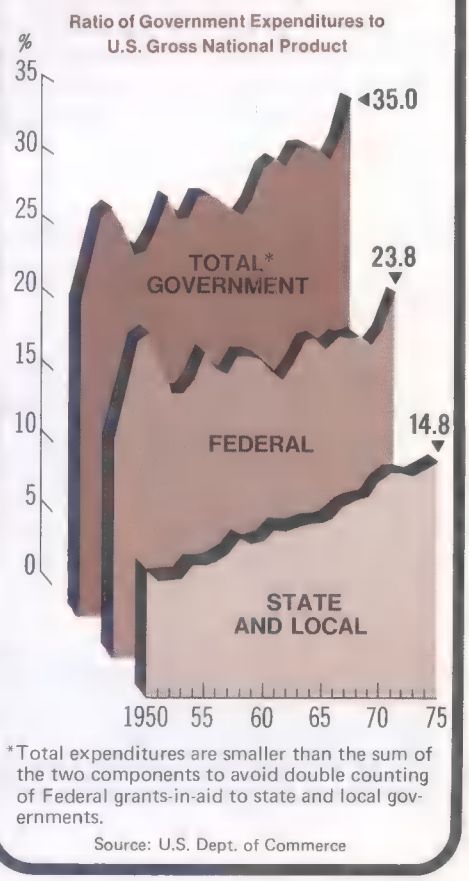
As I look ahead, I think there is reason to be somewhat more optimistic about fiscal trends. Of key importance is the new Congressional budget procedure, in which Congress sets a budget ceiling and holds programs within that overall ceiling. The old approach of piecemeal spending led to overspending. There is a new discipline that worked in the trial run for the current budget year, and I am optimistic that it will work in the new fiscal 1977 budget.

Will we ever get back to a balanced budget or surplus in a prosperous economy?

There is solid reason for hope on this front. Federal revenues grow automatically as the U.S. economy expands. President Ford's new budget projections show that economic growth will boost Federal tax revenues by $235-billion in the next five years. That gives us a lot of potential for developing surpluses in the budget. And we will need those surpluses when we get back to full prosperity. By retiring debt, the Federal treasury would be helping to divert some income from consumers into the capital markets. Those surpluses would do double duty in fighting inflation and helping the nation meet its huge capital needs in the decade ahead.

Where do all those taxes go?

Washington is still the big one. But state and local governments are coming up fast with a doubling in their percentage of the take.



*Total expenditures are smaller than the sum of the two components to avoid double counting of Federal grants-in-aid to state and local governments.

Source: U.S. Dept. of Commerce

Does that rule out future tax cuts? There are signs of a taxpayer rebellion . . .

I've been in the field of taxation for 40 years and I've noticed over the decades that the American people are *always* in a rebellion against taxes. But, in actual fact, Americans are more lightly taxed than are most people. Total taxes in the U.S. equal about 30 percent of GNP, whereas they run from 33 percent to 39 percent in most of continental Europe; and in Scandinavia taxes equal up to 45 percent of GNP.

Voters are rebelling, too, against spending, judging by the bond issues that have been rejected.

Yes, rejections have been the highest in many years.

Why is that? And what are the implications?

I think there is a resentment against taxes that already are squeezing the family budget, and there is a strong desire to head off any new programs that will add to those burdens. One consequence almost surely will be a slower expansion of state and local government than we have seen in the past 15 years. Contributing to that trend will be the fact that the school population, reflecting an end to the baby boom, will grow more slowly and thus moderate the rise in educational expenditure.

The new budget styles in California and New York seem to be that of a penny-pincher. Will that last?

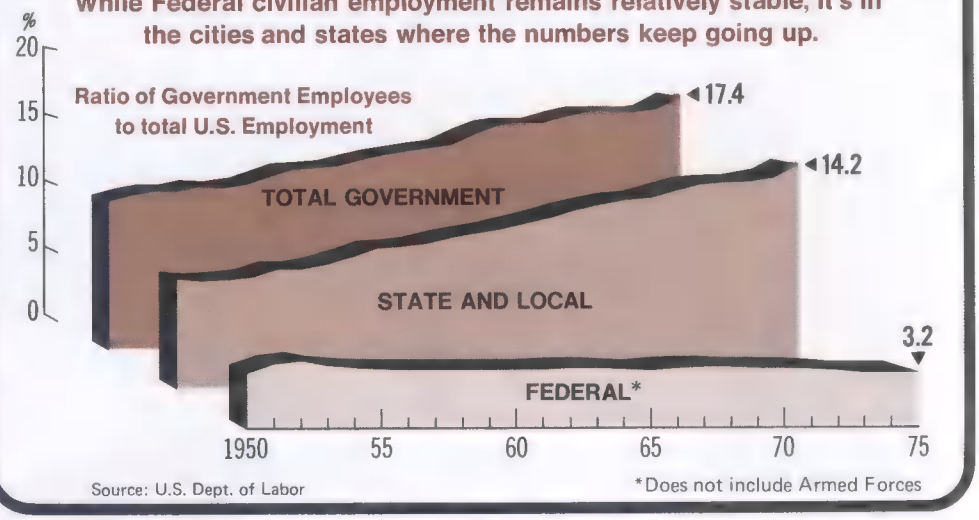
You could add Connecticut, and Massachusetts, and several more. There is a new sense of austerity in state and local budgets. The real test will come when the budget cutters start whacking into spending for powerful groups—education, welfare, health, etc. But right now, the mood is one of retrenchment.

To what extent is this austerity due to recession?

Only partly. There seems to be a more abiding backlash against big government. And for that matter, those who think like California's Governor Brown feel that we should "think small" not only about government, but about business, about unions, and about our own standards of material comfort.

Too large a government payroll?

While Federal civilian employment remains relatively stable, it's in the cities and states where the numbers keep going up.



Is government getting too big, posing a threat to individual freedom?

In an economic sense, the threats to freedom come from government regulation and control—for example, the broad wage and price controls. Actually, although I oppose it, one could conceive of a socialist type of government that still left the individual a lot of freedom of choice, particularly on the political front. Threats to freedom are identified less with the size of government spending and more with regulations, controls, and intelligence operations.

[Editor's Note: Professor Herbert Stein, also a chief economic adviser to a President, took the opposite view in Think, *Nov./Dec. 1975. He saw economic freedom and personal freedom as virtually interdependent.]*

In today's world, what in your view is the proper economic role for government?

Basically, the economic role is to step in where the free market system fails to do the job, where it lets us down. We rely on the market system to tell us what to produce and how to distribute it, to create jobs, and so forth. But the impersonal forces of the marketplace break down at some points. Sometimes people can make more money, not by building a better mousetrap, but by combining in monopoly. So we need antimonopoly laws. Some businesses, instead of serving consumers, cheat them with false advertising, or securities frauds, or adulterated products. The government plays a protective role for the consumer. And, of course, there are government programs to help the poor through income-support measures. Lastly, government has a role to play in offsetting the swings in private spending by consumers and business that may bring on recession or inflation. That's where budget policy and Federal Reserve policy come in handy.

What kind of fiscal policy do you see as appropriate for the next two years?

This year, the Congress has to see to it that President Ford's budget cutbacks—which would put a $30-billion chill on the economy and slow down recovery in 1977—are not carried too far. By the end of this year, unemployment still will be running about 7 percent, and total U.S. output still will be falling about $125-billion short of the U.S. annual productive potential. Under these circumstances, fiscal stimulus in 1976-77 will reflect itself in more jobs, output, profit, and tax revenues—not in more inflation. But as 1977 wears on, there may have to be a gradual shift toward restriction.

We've talked about fiscal policy; but what is meant by "monetary" policy?

Essentially two things. Regulation by the Federal Reserve System of the flow of money in the economy (basically the amount of money people and businesses have in checking accounts and time deposits) and the resulting impact on the level of interest rates. The Fed influences the money supply and the level of interest rates principally through its open market operations. When the Fed wants to pump money into the economy it buys government securities, which expands commercial bank reserves and increases the supply of money. When it wants to contract the money supply—for example, if inflation were threatening—it does the reverse: It sells its government securities and drains money out of the economy.

Monetary policy has been our initial weapon against booms and slumps. The Federal Reserve can change money conditions more quickly than Congress can change taxes. And expenditure shifts take time.

Has the Fed been doing a good job?

I think it had been doing a creditable job up until the start of the recent slump in 1974. But in the face of the cumulative recessionary forces in 1974, aggravated by the severe blow of a quadrupling of oil prices, I think the Fed stepped on the monetary brakes too hard and helped make the recession more severe than it need have been.

And more recently?

In late 1975 and early 1976, the Fed was easing up, and interest rates were dropping. Even with the economy moving up briskly now, it is still so far below par that the Fed should accommodate expansion by keeping interest rates at reasonable levels. It should bear in mind that high interest rates and tight money aren't going to influence the price the Arabs charge for oil, nor prevent a drought in the corn and wheat belts, nor have much influence on the teamsters or construction unions. But if the Fed puts on the brakes, it *will* cut consumer demand, crimp housing, and discourage business borrowing.

What's the outlook now for inflation?

I'm optimistic. It took an incredible combination of circumstances to produce the inflation nightmare of 1973-74: a 500 percent jump in oil prices, a 40 percent jump in food prices, decontrol of wages and prices, devaluation of the dollar, and a worldwide boom in commodity prices. We won't get a combination like that any time soon, if ever.

A final subject: Some economists are warning that the welfare state is getting out of hand, that it is crushing the working man. Is that burden going to keep getting heavier?

Welfare payments have grown, and fast, in recent years—partly because the Federal Government has become more generous with its benefits and partly because many people who have been eligible for these programs have become aware of them for the first time. As a consequence there's been a bulge. But you should not take the recent *rate* of rise and project it into the future.

Are you saying that the rate at which welfare grows will diminish?

Over the coming years, yes. National health care would add quite a bit, but that, too, would be a one-shot addition. And don't forget that we will have a 20 percent increase in per capita real income in the 1970s. That will help us to take better care of the disadvantaged.

Then you don't think we are heading for a situation in which half the work force will be supporting the other half, who won't be working?

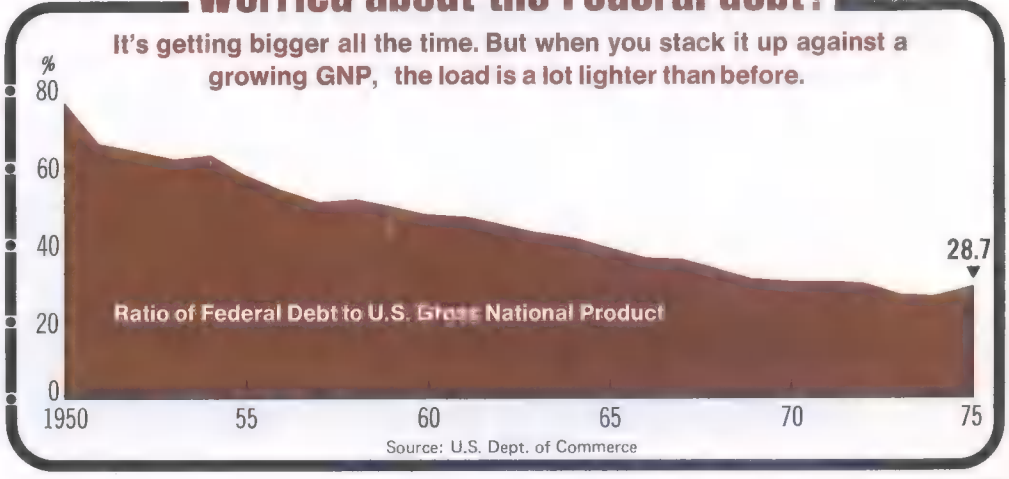
I doubt it—the size of the retired and nonworking population *will* be larger relative to the working population (while the number of children decreases as our birth rate goes down), but don't forget that our per capita income also will be rising as far as the eye can see. So while our tax burdens may rise in the longer run, there is no reason they should crush us. Personally, I think we have had an overdose in the past few years of poor-mouthing and bad-mouthing and scare-mongering about the American economy. This is still the strongest economy in the world. We still have the strongest currency in the world. We still have a government that is controlled by the people rather than the other way around.

So, in closing, let me urge that we take a much more positive attitude. If things are not right, we have the resources and ingenuity to change them. I for one, have not lost faith in the American economy and American democracy. ■

Dr. Walter W. Heller is Regents' Professor of Economics, University of Minnesota, and was chief economic adviser to President John F. Kennedy. He was interviewed for Think *by George Cruikshank, formerly with* The Wall Street Journal *and* U.S. News & World Report, *and a writer on business and economics.*

Worried about the Federal debt?

It's getting bigger all the time. But when you stack it up against a growing GNP, the load is a lot lighter than before.



Source: U.S. Dept. of Commerce

Part V IN THE SERIES ON BUSINESS AND HOW IT WORKS

Politics and econom

by Max Lerner

The statistics these days tell sad tales about the rising divorce rate, but I can cite one remarriage in progress. It is between economics and politics. May it be a long and happy one, as a remarriage of true minds ought to be.

Originally, *economics* derived from a Greek word meaning the management of a household. *Politics* came from another word meaning the governing of a city. Today, the public households are a mess, and the world's cities—now called nations—are proving ungovernable. But the terms still stick.

It was in the last quarter of the 18th Century that economics came of age, emerging in splendor with Adam Smith's path-breaking book on *The Wealth of Nations,* published in 1776—the same year as the Declaration of Independence, Watt's steam engine, and Gibbon's *Decline and Fall of the Roman Empire.* Any modern businessman finds himself at home with Smith's book today, because it is about money and goods and power, about traders and entrepreneurs. It made a stir in the world because it urged free trade, free markets, and minimal government interference with both. In brief, it outlined where economics and politics touched and intertwined—in *political economy.* A fateful marriage had taken place.

Smith's central principle is still batted around whenever people talk about capitalism, socialism, and national economic planning—and it is still miraculously alive. He got it from "moral philosophy"—a kind of social psychology of the time, with some ethics added. It was the broad principle that the nation's interests are best served by giving full play to the self-interest of the individual. Conservatives will swear *by* this principle; liberals will swear *at* it.

Brashly, I once wrote a long introductory essay for an edition of *The Wealth of Nations,* saying, in effect, that it was a great book—but, that in a world of giant business concerns, big unions, big cities, big armaments, and big governments, it no longer applied. I haven't changed my mind. I still feel that Smith's dream of a nation run by unregulated self-interest is an impossible one for us to dream. But if you pressed me hard today, I don't know what we have discovered to take the place of self-interest as the hard-core motivation of political economy.

The public welfare, or commonweal, is a goal, *not* a motivation. The task of political economy is to find a way of serving the public welfare by creating a frame of enterprise and government within which everyday human motives can operate efficiently.

On the question of why economics and politics split away

from each other, especially in America, my guess has to do with the nature of marriage. Some marriages die when the partners are unfaithful or bored with each other; some when one partner has a runaway success that gets too big for the marriage. That's what happened in America to political economy. Business had become the passionate concern of the nation. An "aristocracy of manufacturers" (in the phrase of the great French commentator on America, Alexis de Tocqueville) captured the imagination of most Americans. It formed the theme of the great success story, that of the captain of industry. The new elite was a striking one: hard-working; single-purposed, tough-grained, confident of its judgments, scornful of sentimental thinking, and mostly hostile to government. The split was in the making.

Its contagion spread across the ocean to Britain. By the end of the 19th Century, professors on both sides of the Atlantic were writing separate textbooks on the principles of economics and on political science. There was a sharp difference of self-image. The economists felt they had a "tough" science of money supply, trade, price movements, costs, wages, supply-and-demand schedules. The students of politics had no comparable precision of study, and felt defensive about it, carrying their sense of inferiority with them like a burning city in their hearts.

In the field itself, away from the study, businessmen acted as if the realm of running a nation were another universe, inhabited by crude, corrupt power-seekers, while politicians acted as if the processes of production and distribution of goods were also another universe, inhabited by crass and corrupt profit-seekers. The public accepted the verdict of each on the other and wished a plague on both their houses. The divorce was complete.

The results of this almost perfect failure of communication may be seen in three recent case histories in political economy, one on the global level, another on the national, and the third on the local.

There can be little doubt that the price decisions of the OPEC oil-producing cartel have been widely misinterpreted—by some as basically economic acts in a near-monopoly price situation; by others as basically political acts within the frame of the Middle East conflict.

Both were wrong, because they are fragmented perceptions of reality. The price decisions, along with some accompanying boycott action, were at once economic and political acts. They were made by men who seemed suddenly to have awakened to the fact that they had a monopoly position and had not been using it to the full.

At the same time, they were meant to show the utter dependence of the oil-consuming nations on a continued flow of petrochemical energy. The West had for some time lived under the illusion that its power of technology and arms could not be breached except by a superior power of technology and arms. This illusion has been stripped away. A little

ics. Together again?

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group of Third World nations—most of them only on the threshhold of industrialism, a number of them awakening to a new militant consciousness of Arab strength—have shown they can use their strategic economic resources as a weapon for gaining political concessions.

The one secret they have pierced is a secret of political economy—the power of collective action in using their strategic economic resources for joint economic and political purposes. Whether there will be, in response, a collective use of the joint economic-political strength of the oil-consuming nations to break their dependence is a question whose answer is still in the lap of history.

On a national level, there has been a similar failure to understand the political economy of inflation. If we see the economy strictly as a piece of economic mechanism, we understand a number of things about it, but not the mystery of the sources of inflation, nor how it feeds on itself at a mounting pace. But if we see it in political and psychological terms as well, the mystery starts to clear.

None of the schools of economics—classical, Keynesian, or monetarist—has yet fashioned an adequate understanding of inflation or a strategy of how to deal with it. When it comes, it will have to include not only the money supply and credit instruments and the demand curve, but also some major elements that we have in the past called psychological and political. I think of the strength of the idea of a welfare state, the use of deficit financing by government in response to rising mass expectations for a better life, the sheer fiscal weight of the debt structure of the "public household."

But, mostly, it will turn on the operation of credibility and confidence. If I have some confidence that prices a year from now won't be runaway prices, I keep my cool. If I lose confidence and get panicky, I make a prophecy which I help to fulfill, and my bet on runaway inflation comes true, thus hurting not only the price structure, but also the fabric of social cohesion itself.

On the local level, the case of New York City's finances is also a study in political management, credibility, and the self-fulfilling prophecy. Through the tenure of a number of mayors, the city budgets were shaped in response to the strength of the unions, various pressure groups, and the dream that liberal political leaders could mortgage the future indefinitely by successive bond issues without ever having to meet the mortgage. Budget-making is always an exercise in credibility. When the bubble burst, the credibility of New York City's obligations all but vanished. The remedy lay in part in a radical pruning of the costs of city operation and a management re-

organization. But it had to lie also in restoring, in some measure, public confidence in the city's ability to make good on its short- and long-term obligations. Again, the self-fulfilling prophecy came into play. If the Federal Government refused to express confidence in the city's future—not by a hand-out but by a partial underwriting of that future—the obligations would be worthless. If it did express confidence, as finally happened after some struggle, the city would have a future.

Under the furious battering of change, much of our old political-economic world lies in ruins, and we are having to build a new one in its place even as we live in the obsolescent structures of the past.

The crucial political-economic institutions of our time are bursting the fences we have built around them. The corporation is the central unit of modern capitalism, but the swift social changes have turned it into a cluster of relations between managers, scientists-technicians, workers, consumers, regulatory agencies, law courts, ecological and other pressure groups, and, usually, a widely dispersed stock ownership. The trade union is similarly complex, with international political power struggles and leadership rivalries that largely mirror those in the larger society. It is as much a political organization as the political party is, and the collective bargaining relations between the unions and corporations have generated a new kind of constitutional law.

There is also a global political economy—if we could only understand it. Given the new global communication grid, the money exchanges in the world's chief financial centers have turned the world into a highly sensitive, fluid organism in which men of every nation—seeking marginal advantage in tiny fluctuations in the value of currencies—can transmit instantly their valuations of the health or sickness of economies and politics. Strange as the idea may seem, this is a form of global voting on relative economic strength, by people who are not citizens of the societies they are judging.

Add to this the political economy of nuclear weapons systems, which operate by a political cost-value accounting outside that of any other economic product, and whose dangers are unlikely to be resolved short of an agreed-upon transnational policing system. Add, finally, the role of the multinational corporation, whose sins have recently received considerable airing. In actual fact, aside from the controversies, it is the chief transnational force in today's world, and its future may point the way to innovative global forms still undreamt of.

Within this formidably new, formidably dangerous, and yet promising frame, how well do we train and choose our leaders in the understanding of political economy?

Americans have not raised their political leaders to understand the mysteries of economics, nor their business leaders to swim like fish in the waters of politics. Alexander Hamilton was the only early political leader with a mastery of economics, which he showed brilliantly in his *Report on Manufactures;* but he never became President. The other early leaders —Washington, Adams, Jefferson, Madison, Monroe—whatever their other merits, had little economic understanding.

Woodrow Wilson was the first President to know what political economy meant, and the great banking reforms of his first Administration bore witness to it. Franklin Roosevelt had an intuitive sense for dealing with the Depression, and for the popular confidence factor as the crux of it. But on world monetary problems, he couldn't find his way among his conflicting advisers. He sent Secretary of State Cordell Hull to the London Economic Conference of 1934, then sent brain truster Raymond Moley to counteract him, then pulled the rug out from under both of them. Many other Presidents were innocent of economics. But in the case of John Kennedy, Walter Heller—his chief economic adviser—felt that Kennedy was learning some of the basic Keynesian approaches to the larger role of taxes and other fiscal policies before his death.

It is not hard to understand why men who have fought their way up the career ladder in politics feel helpless on economics, and why others, who do well in business, often show themselves inept in statecraft. Where politics deals with power and order, economics deals with wealth and profits. Where politics assumes a leader's concern for the general welfare, economics assumes a medley of individual self-interests that either may or may not add up to the social interest.

Yet the crucial aspects are not where they differ but where they meet and join. Each has something of its own to contribute to the amalgam: Economics has its tough-mindedness and its imperative for making ends meet; politics has the idea of power and leadership, and its commitment to an ordered society. The remarriage of the two, which the pressure of events is forcing on us, will be possible only if we show a capacity for continuing creativeness and self-renewal as a people. ■

Max Lerner wears many hats: professor, lecturer, writer of a widely syndicated newspaper column, and a contributor to national magazines. He has taught at numerous colleges, among them Harvard, Williams, Sarah Lawrence, and Brandeis. The best known of his dozen books is America as a Civilization. *He was educated at Yale, Yale Law School, and received a Ph.D. from Brookings Graduate School of Economics and Government.*

GOOD RIDDANCE

After almost 15 centuries of pestilence, smallpox is on the way out. With the help of a computer.

It's "mopping-up" time in Ethiopia. The helicopters swing low over the mountainous countryside, searching tirelessly for a clearing in the highlands. A few days later, the four-man team they leave will be picked up to declare the village free of the enemy, and back at Addis Ababa headquarters, another white pin will be placed on the map.

The enemy is smallpox, and it is about to be erased from the earth. Today it exists only in Ethiopia, where it is in its death throes in a cluster of remote villages. It has been routed from every other country by the "Target Zero" campaign of the United Nations' World Health Organization (WHO).

Nine years ago, when the campaign began, smallpox was still endemic to 30 countries, with an estimated 2.5 million cases. WHO mobilized 2,000 epidemiologists from 50 countries, and the campaign swung into action on four broad fronts: South America, Indonesia, the Indian subcontinent, and Africa. As 1975 began, only three countries still reported cases. On August 14, India, where smallpox had killed 31,000 just the summer before, was declared free of it. Bangladesh has not reported a case since last October and is now off the endemic list.

That leaves Ethiopia, where the strain of the disease is a mild one, causing a death rate of only 1 to 2 percent. When the last case is uncovered—it could happen this spring—man will have made a disease extinct for the first time in history.

In terms of human life, the achievement is nothing short of spectacular. There are financial benefits as well. National governments will save the $1-billion they now spend each year to guard noninfected countries.

The battle against smallpox has been waged by indefatigable health workers who scour towns and villages, inoculating as many as 1,000 persons a day with the new bifurcated (two-pronged) needle. Their routes have been determined with the help of an IBM System/370 Model 158 at the International Computing Center in Geneva. This is an interagency organization at the disposal of all United Nations organizations in Geneva. The Model 158 is used to pinpoint trends and outbreaks of smallpox, allowing WHO to concentrate its limited manpower where it is most needed. (The computer is also used by WHO for studies of heart disease and adverse reactions to prescribed drugs.)

A child is inoculated in Bangladesh, which has been free of smallpox since last October. As recently as 1957, 100,000 cases and 60,000 deaths were recorded here in a local outbreak of the disease.

The Black Lady, as smallpox is often called, has ranged the world longer than almost any other major disease. When the Bishop of Avenches wrote about epidemics in France and Italy in the year 570, he used the word *variola* for the first time to describe the spotted appearance of patients. The first vaccine was created by Edward Jenner, a British doctor, in 1796, but it wasn't until 1967 that freeze-drying made it safe to use vaccine in warmer climates.

In 1926—belatedly, in the opinion of many health experts—smallpox was made "internationally notifiable," joining the fearsome ranks of bubonic plague, cholera, and yellow fever. Soon it became the only disease requiring an international certificate of vaccination.

There is, quite simply, no cure for smallpox. Lord Macaulay in the 18th Century called it "the most terrible of all ministers of death," and it has sustained that appalling reputation. The virus kills one of every four people it strikes, leaving the other three scarred for life and sometimes blind.

Man is the carrier. He spreads it through pustules or scabs on the skin, and by sneezes and coughs. And he alone can spread it; animals and insects can't, nor can it be transmitted by food or water. And this is why it is possible to wipe it out. When the human chain is broken—when the last scab leaves the skin of the last patient—smallpox will be no more.

To break that chain, WHO made the crucial decision early in its campaign to stop mass inoculations—some were receiving the vaccine twice; others (mostly nomads) not at all. The new policy was search and containment. Health teams went to homes and to public places like schools and markets. They broadcast warnings over radio, put up posters, showed photos of the disease. Had anyone seen a person with such marks? Rewards were offered—as much as 1,000 rupees ($120 U. S.) during the final effort in India.

They fought off insects and wild dogs, lived in tents, drank questionable water, sometimes fled from villagers who hurled stones, sticks, or even spears at them. When someone was found with the telltale spots, they unpacked their needles and went to work. "If there is just a 1 percent chance that a rash might be smallpox," says a Bengali epidemiologist in Bangladesh, "we err on the side of quarantining the person, vaccinating everyone within a one-mile area, and intensifying a search for other cases within a five-mile radius."

There have been setbacks along the way. On February 15, 1972, Hadji-Ibrahim Hati, a 38-year-old Moslem priest, returned to his village of Danjana in Yugoslavia from a pilgrimage to the Holy Places of the Middle East. Friends and relatives rushed to greet him, unmindful of his tired, feverish appearance. It was smallpox, contacted from another pilgrim, and in six weeks it would kill 35 people. And in October 1974, when the disease was all but gone from Bangladesh, flood waters rose, and the migration that followed kindled a major epidemic.

This Asian tribesman, who has seen the telltale spots in his village, directs health workers to the afflicted families. In the final drive against smallpox, monetary rewards are spurring such assistance.

Now it is almost over, and soon the final white pin will go on the map at Addis Ababa. Then there will be rigorous investigations by international commissions. It will be two years after that before smallpox is officially declared eradicated.

"Until that point is reached," says Dr. Halfdan Mahler, Director-General of the World Health Organization, "case detection and reporting systems must stay alert; containment systems must remain quick and strong." The need for vigilance is obvious, because The Black Lady has made comebacks before. But her prospects have never been worse. ■

Report from

What's happening in that Justice

by Peter Hillyer

In May the Justice Department vs. IBM antitrust trial will be a year old.

What has happened in Courtroom 110 in the U.S. Courthouse in downtown New York City where this legal confrontation —the largest case of its kind to go on trial—is taking place?

After more than six years of waiting and two postponements, the trial opened on May 19 of last year, a Monday. It was unseasonably warm, but the courtroom—high-ceilinged and paneled in dark wood —was completely filled with spectators, participants, and members of the press.

The Justice Department, in its opening statement, said that IBM had monopolized the general-purpose digital computer market. What is more, charged its attorneys, various acts and policies of IBM—for example, educational allowances, bundling (the charging of a single price for equipment and related services), the alleged premature announcement of machines—had been conceived and carried out to keep this monopoly and drive competitors from the business. All of this, the government had contended, represented a violation of Section 2* of the 86-year-old Sherman Act, the nation's oldest antitrust law. Should it win, said the government, it would seek to have IBM broken up into separate competing units.

The Justice Department's charges were without merit, answered IBM. The government's view of the market was myopic. There were not a few firms in competition with IBM, as the plaintiff argued, but hundreds. There was no monopoly. IBM, said Thomas D. Barr of Cravath, Swaine & Moore, the New York City law firm representing the corporation, owed its success to skill, foresight, industry, and a certain amount of good luck. The data processing industry was healthy and flourishing, not sickly from single-company monopolization.

In the early 1950s, Barr pointed out to the court, companies like General Electric and RCA, which have since dropped from the computer market, had their chance. They were the giants. IBM was

* Section 2 defines as a violator . . . "Every person [or firm] who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations . . ." Interestingly enough, the Sherman Act does not define what a monopoly is.

Foley Square

Department antitrust suit?

the pygmy. "They could have competed," said Barr, "but they didn't see what IBM management saw."

The opening statements were on the so-called old issues, those spelled out in the original complaint filed on January 17, 1969. Two additional charges had been added by the Justice Department a few months before the trial (and over IBM's strenuous objections), and these, it had been decided, would be dealt with at a later time. Essentially, the new charges were that IBM had monopolized the computer peripherals market, and had deliberately fostered an environment which favored leasing over purchasing—a tactic presumably to the benefit of resource-heavy IBM.

The charge having to do with peripherals was sparked by Telex's original trial-court win on the same issue. But only a few weeks after Judge David N. Edelstein, who is hearing the Justice Department vs. IBM case without a jury, had allowed the original government complaint to be amended, a Federal appeals court reversed the Telex decision completely. Speculation in the press was that this turn of events hardly could have pleased Justice Department attorneys, and *Newsweek* called it an "embarrassment."

The Justice Department took a day to present its opening statement, and IBM took a day and a half. Then, on May 21, the first witness took the stand for the government. He was Dr. Sidney Fernbach, director of computation for the Lawrence Livermore Laboratory. He and other witnesses to follow—all of them with a long-time involvement in the data processing industry—were called by the government to give the court the history and characteristics of that industry. Many, apparently, also were presented to support a fundamental government theory that the market allegedly monopolized is one competed for by only a handful of companies.

In addition to testimony, the court record was swelled by depositions—statements made under oath and with attorneys present—read in court by the Justice Department, and by hundreds of document exhibits.

All of this has taken time, and the trial has proceeded more slowly than anyone apparently had anticipated. After 10

months, only 25 government witnesses had taken the stand, and most observers agree that, at this pace, it will be a long time before the Justice Department vs. IBM trial is concluded.

Judge Edelstein, who is chief judge of the U.S. District Court for the Southern District of New York, has expressed concern at this slowness, and has asked counsel for both sides to do whatever they can to move things along.

Recently, in an effort to comply with this request, IBM waived its right to time off for the purpose of preparing for new witnesses (from Xerox) who had been added by the Justice Department.

To date, most of the government witnesses, in addition to industry "experts," have been executives of companies that compete with IBM, or used to but have since left the computer business—Scientific Data Systems (which was purchased by Xerox), Honeywell, Burroughs, National Cash Register, Control Data, RCA, General Electric, Sperry Rand, Digital Equipment.

They have given their impressions of life with IBM, and not all of these recollections have been flattering; yet, some of what the government's witnesses have said has been surprisingly positive.

For example, Reginald H. Jones told the court that he knew of no act by IBM that had driven his company out of the computer business. Jones is chairman of the board of General Electric.

Robert Oelman, former chairman of NCR, described the computer industry as "very dynamic" with "new competitors entering the field across the board every day."

Richard M. Bloch, a data processing consultant who was with GE, expressed admiration for IBM's "splendid management." He said that IBM manifested a greater dedication—a "commitment and resolve to succeed"—than did either Sperry Rand or GE, and added that IBM did not have the resources of either of these companies when it entered the computer business in the early 1950s.

Ray W. Macdonald, chief executive officer of Burroughs, in a deposition read into the record, said IBM had been successful because it has had a continuity of good management over many years.

Anthony L. Conrad, RCA president, said that nothing that IBM or any other competitor had done forced RCA out of the computer business. He said he believed that if RCA had continued to make and market general-purpose computers, it could have made that business profitable.

At press time (early April), the Justice Department had about 75 witnesses still scheduled to take the stand. Then it will be IBM's turn. The company's witness list is formidable, and includes many users of IBM equipment—quite a few of them from government agencies—as well as IBM employees, and consultants, economists, educators, and other specialists.

Of course, since the start of the trial nearly a year ago, not all of the action has been confined to the testimony of witnesses. Among some of the other legal proceedings that have taken place:

- IBM, after the government's opening statement, asked the judge to dismiss the case or render a summary judgment in IBM's favor. The government, said IBM, must prove that IBM willfully acquired and maintained monopoly power through predatory or exclusionary acts. But apparently, said IBM, the government thinks it can prove a violation of the antitrust laws by establishing intent to monopolize —regardless of the corporation's conduct in the marketplace. IBM's motion was denied.
- IBM petitioned the U.S. Court of Appeals for the Second Circuit for a writ of mandamus. This is an order from a higher court to a lower one saying that it, the lower court, must desist from or abide by certain rules and procedures. IBM contended that various actions by Judge Edelstein were prohibiting it from mounting an effective defense, and the appeals court agreed. Judge Edelstein was told to eliminate certain procedural restrictions which he had instituted.
- IBM asked the court to vacate an order, in effect since 1972, that prohibited either side from commenting publicly on the case. The ban was lifted. Frank T. Cary, IBM chairman, said that the vacating of the order would give the company the right to speak out when necessary to correct factual errors in the press and to defend itself against untrue and damaging allegations. However, he added, IBM must be careful not to abuse this privilege.
- IBM asked the court to order the Department of Commerce to hand over census information about the data processing industry which IBM thought was important to its defense. The motion was denied.

Since last May, the schedule for the court has consisted of morning and afternoon sessions Monday through Thursday. As chief judge, Judge Edelstein has significant other administrative duties, and he has other cases (including patent suits brought by Xerox against IBM and consolidated in the Southern District for discovery) that demand his attention.

Much of the attorneys' work is done outside of court, and, certainly, late nights and work-filled weekends are common to IBM's lawyers and its litigation-support teams, composed of IBM people with administrative, marketing, financial, and technical backgrounds—many of them veterans of both the Greyhound and Telex litigation. A summer adjournment from July 10 to September 22 was used to prepare for the new issues added by the Justice Department.

In the courtroom, Barr is usually accompanied by three other Cravath, Swaine & Moore partners: David Boies, Paul M. Dodyk, and Robert F. Mullen. The Justice Department team is led by Raymond D. Carlson, a veteran attorney who has been with the government since getting out of law school.

The courtroom is no longer crowded, perhaps because, as a writer for the *Philadelphia Inquirer* observed about the trial, "to the casual observer it seems a . . . dull debate over machines and marketplaces, hardware and software, tapes and disks." A few spectators drift in and out, a few members of the press—most of them from industry trade journals—take notes.

Still, the trial moves on. Transcript pages pile up (there were over 15,000 after 10 months) as the inner workings and relationships of men and companies are revealed, examined, and challenged in a public forum.

Exciting? Probably not, unless you are a student of the data processing industry, an antitrust-law buff, or just like to sit in courtrooms. But the inescapable fact is that the trial is a momentous legal event and of crucial importance, not only to IBM but to the industry in which it operates.

IBM maintains that it has done nothing illegal, that it is not a monopoly, and that, indeed, as stated in its pretrial brief, its success is due to the "skill and hard work of thousands of IBM employees at all levels of the corporation," and that this success is the "natural consequence of superior effort and competition in a free and evolving marketplace."

One thing is sure. After nearly a year in court, the story has only begun to unfold. ■

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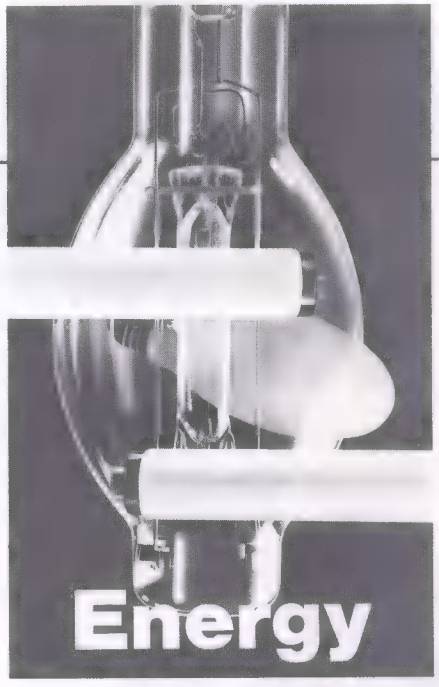


More savings

When the oil embargo of 1973 touched off escalating fuel and electricity costs, IBM did what any smart home owner would do. In the words of IBM Senior Vice President Robert W. Hubner: "We lowered the thermostats and turned off some lights."

Such homey economies, plus others, resulted in savings valued at $20-million in 1975 and $13-million the year before in the U.S. alone. The overall corporate goal for the U.S. this year is a 5 percent reduction in the amount of energy consumed in 1975.

But that's not the whole story. It's a worldwide effort. On March 11 and 12, IBM plant engineers from all over Europe—and representatives from IBM Japan and the U.S.—met in Montpellier, France, to talk about energy conservation and share their tips on savings.

And in Washington recently, Hubner testified before the Subcommittee on Energy of the Joint Economic Committee of Congress, which has been asking businessmen for advice on conservation measures. Hubner, chairman of IBM's Energy/Resource Committee, reviewed the company's program. He also explained how computer analysis and simulation help IBM architects and engineers predetermine how changes in architectural design and in mechanical and electrical systems can reduce a building's energy consumption.

At 14 IBM locations in the U.S., System/7 computers are now being used, to varying degrees, for power management—to monitor and control heating, ventilation, and air conditioning. This number will double in the next 18 months.

Many companies are now using computers to reduce their energy bills. Hubner told the Subcommittee: "We are working with 400 such users, who have reported savings up to 25 percent or more on their electric bills. In the aggregate, this amounts to more than 1.2 billion kilowatt hours annually. That's enough to offset the total residential electric needs of the entire state of Wyoming." ■

Not long before President Ford's State of the Union speech in January, an urgent call from Washington came into the office of Professor Lawrence R. Klein of the Economics Department in the Wharton School of the University of Pennsylvania in Philadelphia.

A spokesman for the President's Council of Economic Advisers wanted a quick answer to an important question that had come up: Was it true that the forecasting experts at the School were predicting that a forced increase in U.S. growth rate would have little effect on world recovery from the two-year-old recession?

This question was pressing because European and U.S. leaders had been urging Ford to take a more active role in stimulating the U.S. economy; indeed, some were accusing him of holding back world progress.

Professor Klein (the builder and operator of the famed Wharton Econometric Forecasting Model) said it was indeed true about the predictions—in fact, a 1 percent boost in the growth of the U.S. Gross National Product, he said, would help the rest of the world by only a fraction of a percentage point.

The spokesman on the other end of the line thanked the professor and presumably went on to assure the White House that its present policy was intrinsically good for world progress.

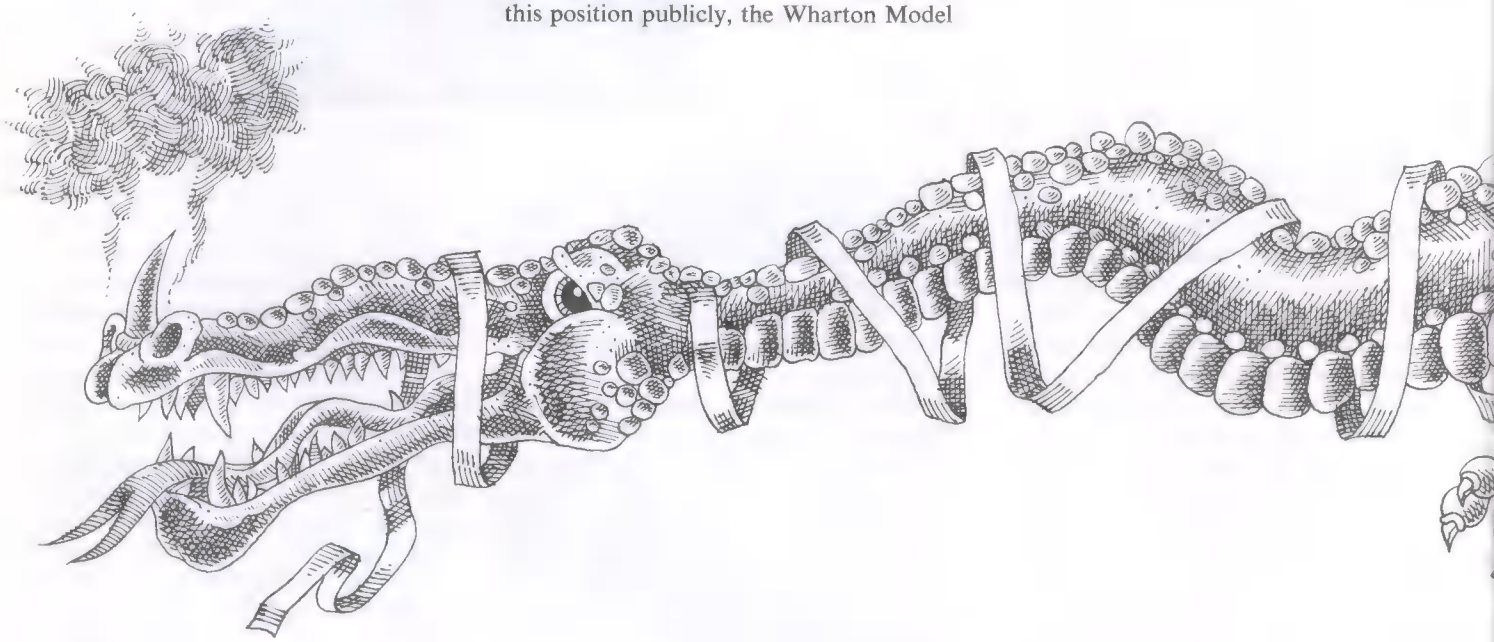
At any rate, the President's State of the Union speech subsequently conveyed optimism in the correctness of the U.S. position not to stimulate the economy, and the Council of Economic Advisers included the Wharton information in its backup report on the state of the economy.

President Ford's apparent interest in getting the advance word from the pundits of Philadelphia stands in striking contrast to a similar situation in early 1974, when former President Nixon was in office. Nixon's viewpoint at that time was that the U.S. was not in an economic recession.

However, just as Nixon was affirming this position publicly, the Wharton Model came up with an analysis and forecast showing that the United States was not only in the grip of a recession, but getting economically sicker day by day. A reporter brought up the apparent contradiction at a Presidential press conference. Nixon looked a bit startled and then said in effect that he didn't believe those guys from Philadelphia. "I say there won't be a recession," he snapped, "based on the facts I can get from economists who should know something about it."

Regardless of the Presidential politics of the moment, the interesting thing is that the econometric model has become so valuable a tool that it seems to be consulted with the frequency with which solons of the early Greek era consulted the Oracle at Delphi. Econometrics—a union of economics and statistics joined by the high-speed computer—is clearly the biggest thing to happen to economics since the law of supply and demand. A large share of the Nobel Prizes in economics has been granted to economists with some association with econometrics and econometric modeling. Universities now offer specialized courses in this field, and while modeling is still somewhat of

by Lee Edson



TAMING THE DRAGON

How computer models help businessmen to cope with the twists and turns of an economy that's always changing

an arcane subject in the public mind, most major businesses subscribe to forecasts obtained by econometric modeling.

Model building is of course a very old activity. One can date it back to Joseph in Egypt, who interpreted Pharaoh's dream —of seven thin ears of corn devouring seven thick ears—as seven years of plenty followed by seven years of famine, and as a result of this prediction, became chief advisor to Pharaoh. Centuries later, scientific models were mostly attempts to simulate the real world on a small scale. The wind tunnel is an excellent example of a simulation model. In a wind tunnel, a small geometric shape made of wood or metal takes the place of a large wing or fuselage, enabling researchers to determine how the shape will undergo aerodynamic stresses.

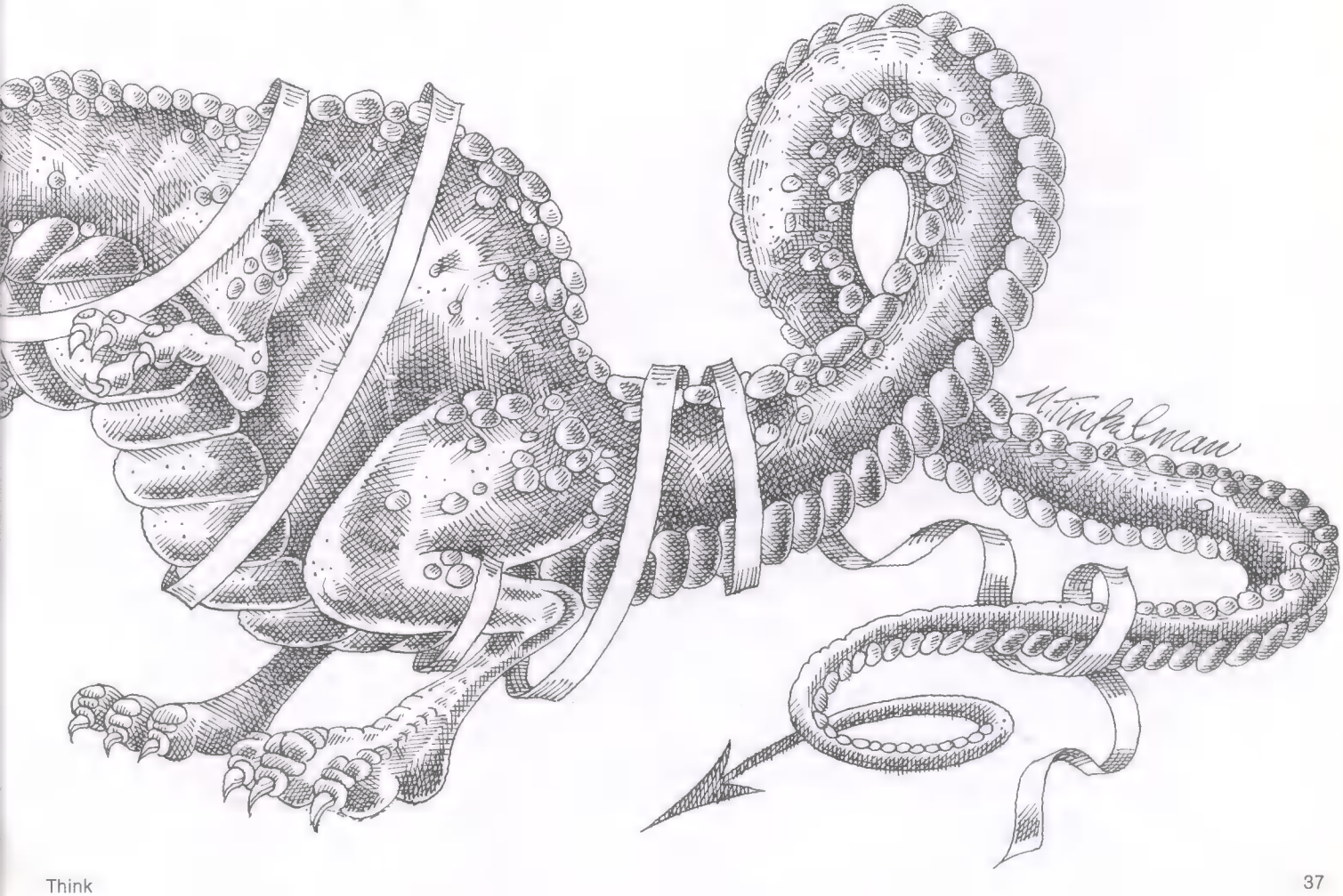
Physical models, however, like Pharaoh's dream, cannot handle complex dynamic systems like the weather, the stock market, or the economy—in which too many things vary with too many other things. As a result, social scientists have turned to mathematical models composed of numerous equations to describe the essence of these realities, with specific information about human behavior cranked in to provide the kind of answers needed in forecasting.

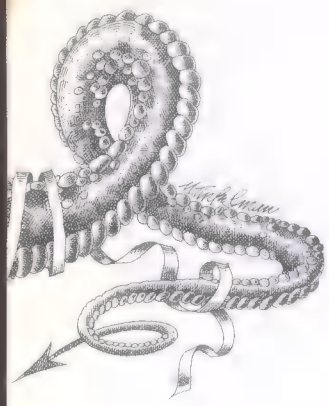
The econometric model is the hottest type of model in this area. What will happen to employment or investment if interest rates rise? What decision should one make about the future of a company if the nation's balance of payments changes? If the government increases taxes, how will national income or industrial output be affected? These are some of the questions that the econometric model seeks to answer on a day-to-day basis.

The modern econometric model was weaned and nursed into its present form by the fertile mind of 55-year-old Professor Klein, who was a student of the Nobelist Professor Paul Samuelson of M.I.T. and, indeed, M.I.T.'s first Ph.D. in economics. At 24, Klein—now known as the dean of econometric modeling—was one of M.I.T.'s youngest students to earn a Ph.D. and to see his thesis, an analysis of John Maynard Keynes's theory of employment, grow into a popular book called *The Keynesian Revolution* and thus become one of the most widely read Ph.D. theses in the world.

In the Forties, Klein became interested in the work of Jan Tinbergen, the Nobel-prize-winning Dutch economist and brother of the famous behavioral psychologist Nikolaas Tinbergen, who also won a Nobel Prize. Under auspices of the League of Nations, economist Tinbergen was commissioned to analyze the causes of business cycles and the Great Depression. To do so he constructed the first econometric model of the U.S. (a follow-up on his earlier attempts to model the economy of his native land).

The advent of World War II delayed further work on the Tinbergen model. During the war and just after it, Klein—who was then at the University of Chicago's Cowles Commission, the nation's first major econometrics institute—was asked to resurrect it. He did. In fact, the model benefited from the help of the great





mathematician John von Neumann, who used to go through Chicago on his way to and from the atomic research center at Los Alamos and often stopped off to solve complex problems for the budding econometricians.

The result of the effort was the birth of a new macromodel—as large and broader-scale models are known—which consisted of 25 equations. It became known in the academic trade as Klein Model One; with further refinements it turned into Klein Model Two. Klein later went to the University of Michigan, where he and graduate student Arthur Goldberger built a third model, which became the grandfather of subsequent U.S. models.

The early work in econometric modeling attracted only limited attention. But in 1954, Klein scored an important victory for modeling when he tackled the predictions of influential British economist Colin Clark. Clark had analyzed the vagaries of the business cycle and concluded in the pages of the *Manchester Guardian* that the U.S. economy would falter in 1954 and collapse the way it did in 1929.

This gloomy view struck a respondent chord in the thinking of many politicians and economists in the U.S. who had been predicting economic devastation ever since the end of World War II. Klein, however, had put the Michigan model through its paces, and came up with a contrary prediction—no more than a mild decline for that year, hardly enough to conjure up the disaster of 1929. This turned out to be true. Businessmen took note of the Michigan group and the emerging science of econometrics.

In the 1960s, with the advent of the high-speed computer, model building exploded. Klein, who, after a stint at Oxford, had surfaced at the University of Pennsylvania in 1958, led the way with the predecessor of the present short-term Wharton Model—which since has given birth to a long-term model—and he was soon watching the influence of these models spread from a mere laboratory curiosity into a decision-making tool used at the highest levels of government and business.

Models were also built for various purposes at IBM, Cornell, Stanford, and Brookings Institution in Washington. The number of equations handled by the most advanced model now goes well over 1,000—and there is a model's model at Wharton known as Project LINK, which puts together in a computer the econometric models from many nations, including the Wharton Model, and taps out a portrait of world trade based on the interactions among all of them. It was the use of LINK that enabled Klein to reveal to President Ford's advisors the effect on the world economy of a stimulus to this year's American economy.

As symbolic of its success, modeling, though still a boutique industry, soon became a profitable business. In 1968, Harvard's Professor Otto Eckstein, former member of the Council of Economic Advisers under President Lyndon B. Johnson, was so fascinated with the potential of the Wharton Model that he joined with the Wall Street brokerage firm of Mitchell Hutchins, Inc., to set up Data Resources, Inc., of Lexington, Mass., which is now said to have 600 big-business clients and to do between 5 and 15 million dollars of business annually. Next in size is Chase Econometric Associates of Philadelphia—a forecasting service owned by Chase Manhattan Bank and headed by Michael Evans, a former associate of Klein's—which recently added international currency trend predictions to its other forecasts. The Wharton Model group, which has been called the nonprofit Tiffany's of econometric modeling, does over a million dollars worth of business, which Klein points out has gone in large part to support the economics research of a number of Ph.D. candidates.

Today, models are opening up new economic vistas. Developing countries, for instance, are getting a lift from models.

Another important trend in modeling is in the direction of specialization for industry. A typically timely U.S. model that is on the front lines of political debate is the new Project Independence model of the Federal Energy Administration, which is consulted almost daily because of the continued heat generated by various aspects of the energy crisis. Recently the big question asked of this model and of others was: What would happen if natural gas prices were deregulated? Among other things, what would be the interaction with the price and supply of oil?

The sides lined up on this question

Shoemaker's children?

Every once in a while, an IBM employee calls Dr. Alvin J. Karchere, the company's director of economic research, to ask whether IBM's econometric model can tell the future of stock prices. Karchere, who is a pioneer in econometric modeling, says wistfully: "I wish I could, but stock prices are one thing we cannot model. They depend on too many uncertain factors. All I can tell you is what the model says about the U.S. economy, and you can decide whether to buy or sell."

IBM's modeling operation has been an integral part of the company planning procedure since the middle 1960s, when the first model was built. Karchere recalls that management became convinced that scientific models could do for forecasting what individuals couldn't do by the "seat of their pants" or by fingering the currents of history. "Because management saw the impact of the overall economy on the company business, they supported us," he says.

As a result, modeling has advanced to the point where IBM's commitment to econometric modeling is probably greater than that of any other U.S. industrial corporation. IBM operates three models of the U.S. economy: a short-term, quarterly model that shows the projected impact of inflation, Gross National Product, and similar items; a long-term model that does the same on a 10-year basis; and an input-output model that projects production of the various industry groups of interest to IBM's marketing divisions. In addition, the economic research department operates a number of econometric models that portray demand for and shipment of IBM products.

"We're also building models of the

ranged along the familiar patterns of political leaning. Most of the New England Congressmen, along with liberal Democrats in other areas, didn't want to deregulate gas prices because they felt the consumer was reluctant to accept the possibility of increased energy costs. On the other hand, the Ford Administration, along with such oil and natural gas producing states as Texas and Louisiana, were in favor of deregulation on the theory that the government should keep hands off private enterprise, and that higher gas prices would lead to increased exploration and supplies.

The big surprise in the lineup was that such states as Ohio and North Carolina also wanted to deregulate. The reason: they could revive some of their industry, which had been shut down because of the shortage of natural gas.

All the model could do in this case was to show the economic effect of alternative decisions—and that in a limited way. The model showed, for instance, that if deregulation of gas occurred, the price of oil would drop and imports would fall off, a goal the government was seeking. If natural gas remained regulated and continued to be relatively unavailable, the model showed that the industry would then turn to oil, raising its price and increasing oil imports. On this basis, some economists recommended deregulation. As things turned out, Congress failed to approve the move to deregulate by a mere four votes.

Just how good are models? Some economists think they're good up to a point. "They're not black boxes," a leading economist says, "but from time to time they do tell us things that run counter to popular conceptions and therefore they can be quite useful. For instance, many people feel that in periods when prices are rising rapidly, consumers will tend to increase their buying to avoid higher costs later on. If true, this would be reflected in an increase of spending over savings as inflation mounts. Models have shown that the opposite occurs. The effect of the inflation rate on spending is negative.

"Apparently, in retrospect, what happens is that people would like to buy now, but they don't, mainly because they have less real money to spend. When the rise of prices exceeds the rise of wages, people's savings diminish in value, and they find they cannot stretch their income. So they do not spend—just as the models indicated.

"In effect, models give us a handle on behavior we didn't have before. They make economists and policy-makers think more quantitatively and more precisely about things that used to be elusive or that were gut hunches."

On the other side of the coin, some major economists regard econometric models as somewhat primitive if not downright black magic. Professor Paul Samuelson, who as leader of the U.S. economics fraternity gets free forecasts from all the commercial forecasters, for example, thinks of them as useful but somewhat limited.

What of the future? The most famous attempt to look at the long-range future by modeling is the work of engineer Jay Forrester of M.I.T., inventor of one type of computer memory core, and his disciple, Dennis Meadows, who is now at Dartmouth. These analysts, sponsored by a group of 100 foreign industrialists known as the Club of Rome, have looked at the complex interactions of continued pollution, increased population, changes in production, and innovations of one sort or another, and concluded that there are "limits to growth," particularly the kind of exponential growth produced by technology; and if nothing is done to curb it, they contend that mankind will be doomed. Doomsday, they say, is as close as the 21st Century.

Considerable criticism of these "models of doom" has developed. The major argument is that "the past is prologue" philosophy—in which the future is read by looking into the events of the past for repetitive activities—doesn't always work in human behavior. In an open system, surprise events can occur to change the entire nature of the data fed into the model; and without taking into account adequate interactions and feedback loops from important social and psychological variables, the entire process of projection is subject to errors that can result in an entirely new and distorted description of reality. Forrester, who is conscious of these criticisms, is working on a new model, due in 1978, which he says will embrace enough social and psychological variables to present as complete a picture of 200 years of American behavior as science can make it.

Econometric models of one kind or another may continue to run into flak from critics, but everyone agrees they are here to stay. Evidently the "tea-leaves" syndrome, which has affected mankind since the time of Nostradamus, is buried deep within our psyches. As Eckstein sums it up: "People simply have to consult the future or they will be at its mercy." ■

Lee Edson, a frequent contributor to Think, *is a former staff member of the Stanford Research Institute, where he conducted a number of economic studies.*

Not when it comes to econometrics in IBM

economies of countries like Japan and Britain," says Karchere, "so we can help IBM's economists in those countries make more accurate forecasts."

IBM's models, like those of other forecasters, are not oracles that mysteriously foretell the future. But their use has made it possible for IBM's economists to maintain a very good forecasting record, and according to IBM economist Dr. Larry Chimerine, manager of U.S. economic forecasting, who is responsible for models of the U.S. economy, the company's economists predicted the recession of 1974 in mid-1973, well ahead of the other forecasters.

"But," he adds, "we fell down as did the others on the oil crisis and the inflation, which caused us to underestimate the full severity of the recession." However, the IBM economists' early warning led to changes of strategy in the company's planning that served IBM well during a critical period.

The future of modeling at IBM appears to be bright, according to the company's economists. As IBM Vice President and Chief Economist Dr. David L. Grove puts it: "Computers have given us the means of collecting and analyzing data on a scale hardly dreamed of a few decades ago, and the costs are low. In addition, there have been major advances in econometrics and in our understanding of economic development processes.

"These taken together afford enormous opportunities for improving forecast accuracy in testing hypotheses; for assessing the success or failure of policies, programs, and projects; for learning from our mistakes and correcting them at reasonable cost."

"We are expert salvagers," says the jeepney driver as he weaves deftly through the streets of Manila. The tassels on his windshield jump and sway, and the sun glints off the chrome ornaments on his hood. Built from U.S. Army jeep parts and outfitted with oversized bodies and rakish fenders, jeepneys are decorated and driven with great gusto. They are quintessentially Philippine, and they seem to be everywhere—from the newly minted thoroughfares of nearby Makati to the twisting roads of small towns.

The Filipino people are much more than salvagers today. They are builders. From the rubble of war they have put together a nation that is confident, assertive, and prospering. The Gross National Product is growing at an annual rate of 6.2 percent. The Philippines is Asia's only producer of nickel and its foremost producer of copper. With 40 major domestic and foreign banks, it ranks just behind Japan as an Asian money market.

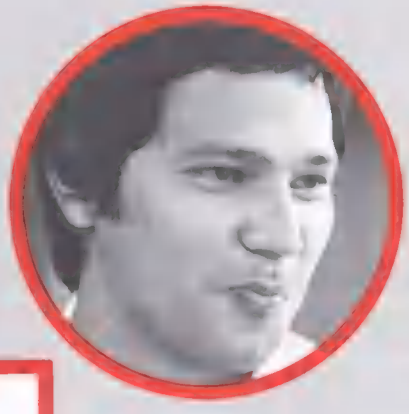
This is a nation of more than 7,000 islands and 43 million people, two-thirds of whom live on the two main islands of Luzon and Mindanao. Although the national language is Tagalog (or Pilipino) and there are 87 dialects, the Philippines is the third-largest English-speaking nation in the world. Its literacy rate is one of Asia's highest, and it is second only to the United States in the number of university students per 100,000 of the population.

Nothing quite symbolizes Philippine progress like Makati. This self-contained metropolis six miles outside Manila was once a place of swamps, snakes, rice fields, and tangled grasses. Now it gleams with office buildings, shopping arcades, and first-class hotels. In September it will be host to thousands of delegates as the International Monetary Fund goes to the Philippines for a meeting.

"In a sense, we have arrived," says IBM Philippines General Manager Ray Reyes, "and in another sense, our nation is still on the threshold. That's what makes things so profoundly exciting."

Reyes, whose IBM background includes assignments in the United States and Korea, heads a company of 283 people. Its business is concentrated on Luzon, Mindanao, and, between them, the Visayan islands. In 1975 it scored solid gains in revenue and profits, and recorded its best

A small company. But it has set its cap for bigger things



Philip

Net Sales Record Increase (NSRI) performance in four years. And it did so in the face of strong competition from companies like Fujitsu, Univac, Burroughs, and NCR.

"By nature, I am impatient," says Reyes. "I want to make the Philippines known as a leader in data processing. And I want our company to be spoken of in the same breath as national progress."

It's already happening. IBM's products are front and center in many areas of Philippine life. Southeast Asia's first computerized on-line banking system is at the China Banking Corporation in Manila. IBM computers are handling reservations for Philippine Airlines, utility billing for Manila Electric, economic research for Philippine National Bank, statistical studies for the University of the Philippines, and weather analysis for the Institute of Meteorology.

The computer has become a mainstay of agriculture—an industry that accounts for one-third of the country's goods and services, three-fourths of its export earnings, and 6 million of its 13 million jobs. At the Department of Agriculture, an IBM System/370 Model 125 turns out forecasts for rice, sugar, corn, tobacco, bananas, and many other crops.

Late last year, farmers began harvesting a rice crop so huge that public buildings and halls had to be used as temporary warehouses. It was the largest crop since the "Green Revolution" began in the Philippines in the late 1960s. True, the weather cooperated, but Philippine officials say it was technology that made the difference. An IBM computer at the University of the Philippines at Los Baños in Laguna Province has been instrumental in research that has increased the area of irrigated land and allowed farmers to plant as many as three crops a year by using early-maturing seeds. Now some of these new high-yield and disease-resistant varieties of rice have been introduced into other parts of the world.

Rice is the heart of the Philippine diet, and it is grown carefully, even lovingly, in fields laced with irrigation canals and on the slopes of terraces. The terraces at Banaue, 250 miles north of Manila, are an engineering marvel. Working on almost vertical hills, the Ifugao tribesmen built rock walls to hold their paddy fields. They created nearly 100,000 acres of level ground 5,000 feet above sea level. For nearly 2,000 years these terraces have been repaired, rebuilt, and cultivated.

While most rice is grown for home consumption, sugar is the Philippines' premier export. At Central Azucarera Don Pedro (CADP) on Luzon, the trucks pull up in long patient lines at milling time. Three thousand planters bring their crops here, and 6,500 tons are processed daily. Inside the offices of CADP, an IBM System/360 Model 20 prepares reports on tonnage, and distance traveled by the trucks. This information is forwarded weekly to the Philippine National Bank, sole buyer of sugar from this *central*. In all, the Philippines harvested some 2.5-million tons of raw sugar last year.

Southeast of Manila, the Bicol River Basin brims with potential. In a job that has taken on the dimensions of regional planning, the government is conducting studies on road construction, flood control, and compact farm development. Programs for this project are developed by Filipino students at the Asian Institute of Technology in Bangkok and run off on the System/370 back at the Department of Agriculture in Manila.

The zest for life characteristic of their nation is reflected in the faces of IBM *Philippines secretaries Vicky Inciong and Menchi de la Fuente, and systems engineer Ben Umali.*

pines

Management, Asian style

It's not that he has anything against Dante or Homer. It's just that in his lectures, Gabino Mendoza would rather quote Confucius or Gandhi. The preference for Eastern thinking is a natural one for the dean of Asia's first graduate school of business.

The Asian Institute of Management in Makati was founded in 1968. Its curriculum ranges from a four-week course in basic management to a two-year master's in business management (achieved thus far by 539 men and women). Now, working with IBM Philippines, the AIM has added computer concepts to this degree.

"At the beginning," recalls Dean Mendoza, "the whole school was like a Harvard transplant—from staff to curriculum. But we quickly realized that, while American business schools produce managers for very large companies, we are nations of small- and medium-sized companies, often run by families.

"More important, we are not trying to develop the administrative manager who is given a set of resources and expected to make the most of them. We need entrepreneurial managers who can find and assemble resources, then go after the opportunities that would otherwise never be pursued. That is a very different animal."

Accordingly, the Institute has given a strong Asian cast to what and how it teaches. Case studies of U. S. companies have yielded to local examples. (One of them is Sarao Motors, the jeepney manufacturer.)

But the school has not turned its back on all things Western. "You know," says Dean Mendoza, "the Asian civilization has roots that are Chinese, Indian—and Judeo-Christian. So there are a lot of very deep wells we can draw from."

When Philippine President Ferdinand Marcos launched what he called the "New Society" in September 1972, the entire Philippines was designated as a land reform area. The Bureau of Lands, which had installed the first computer (an IBM 650) in the Islands in 1960, used its IBM equipment to map out parcels of land involving more than 1 million tenants and 200,000 land owners. To date, titles for land have been given to 178,000 former tenant farmers.

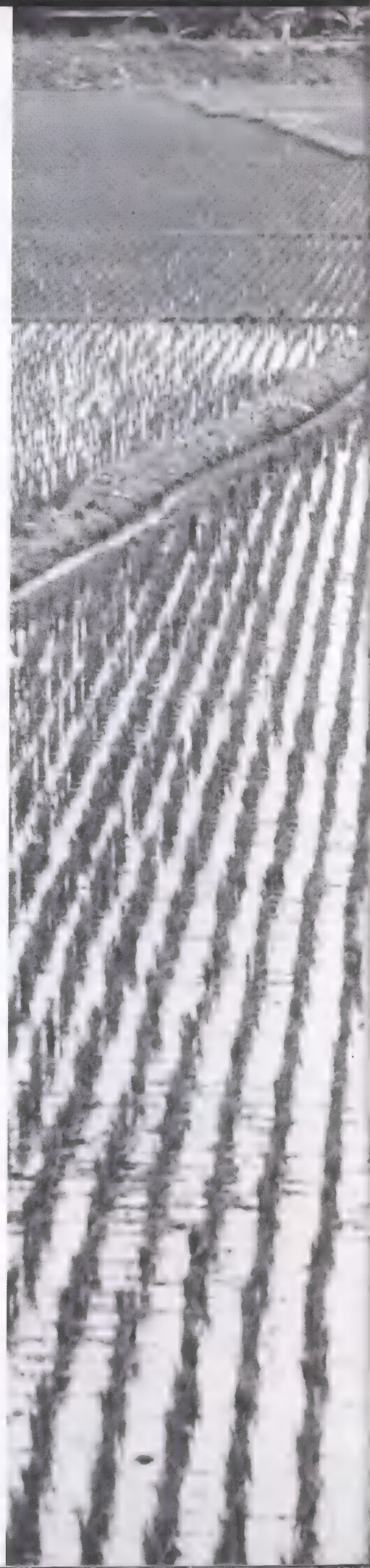
"These are the kinds of efforts we want to be a part of," says Rupert Capistrano, director of DP marketing for IBM Philippines, "because they really contribute to national progress. Computers in the Philippines are helping to speed up the timetable for developing our country's resources."

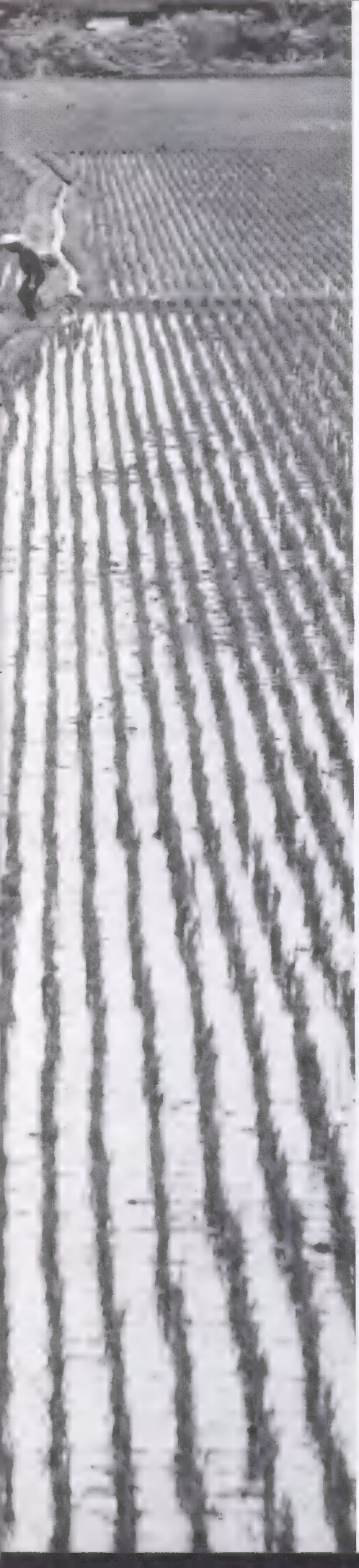
In Office Products, while there are still too many manual typewriters around to please OP Manager Tony Serna, the trend is now toward electrics. Eighty percent of IBM's customers are in the Greater Manila area, but OP is also looking south to Cebu and Bacolod, where there are now sales and service outposts. Strongest competition in the Philippines: the German firms, Triumph and Olympia.

"Power typing is our strong suit," says Serna. The first magnetic tape system in the Far East went to the newspaper *Business Day* in Manila. The Asian Development Bank has 500 typewriters, graphics products, and magnetic keyboards. Another large OP customer is the National Media Production Center, which turns out 15 million publications a year on everything from oil exploration to household tips. The Supreme Court is an IBM Composer user.

Serna believes that the electric typewriter market is a telling business barometer. "The barometer, however, indicates that the business outlook in the Philippines is excellent and will stay so for some time."

(Continued on page 44)





At the heart of the "green revolution" in the Philippines is rice, staple of the national diet. Last year's crop was a record, largely because of better use of land and early-maturing seeds.

A way of life called 'Bayanihan'

A visitor to the Philippines quickly encounters the extraordinary warmth and vivaciousness of the people there. Filipinos love music, sports, beauty pageants, and the laughter that springs from a good joke. And they have made *Bayanihan* a way of life.

Bayanihan means "working together." More than that, it is a sensitivity to others and a fierce dedication to the job at hand. In the case of IBM Philippines, it can be exemplified by a person and a project: Joe Seña and *Bukas Palad*.

When the Watson Business Machines Corporation set up shop in the Philippines in 1937, Joe Seña was one-third of its total work force. Towards the end of the Japanese occupation, he and other customer engineers moved machines and spare parts by pushcart to his home in Pasay. From there they continued to serve customers such as the Bureau of Census and the Government Services Insurance System.

After the war, Seña looked after unit record equipment at U. S. Army Headquarters in Manila. By the time the computer age arrived in 1960, he had taken on some of the aspects of a legend. But he was a lively, versatile legend, and soon was put in charge of constructing the new IBM Philippines Headquarters building in Makati.

Joe Seña is retired now, and his lunchtime Scrabble companions must play without him. But he is remembered by many. One who worked for him says simply, "If I had ever given him less than my best, I would not have forgiven myself."

Bukas Palad means "Open Palms." Its origin was a visit to a coffee shop by Teena Serna, communications and administration manager. The shop was run—confidently and well, she felt—by deaf-mutes. It got Mrs. Serna to thinking. Could IBM help train such people for other jobs in business? Almost at the same time, the Pasay City chapter of the Philippine Jaycees was thinking of some project to benefit the deaf-mutes; and, coincidentally, IBM Philippines General Manager Ray Reyes also had a similar project in mind for prisoners. All this thinking came together, and at a meeting between IBM and the Jaycees, Project *Bukas Palad* was born.

Soon after, at the company's education center in Makati, keypunch classes began for high school seniors from the National School for the Deaf.

"This is a punched card," said the IBM instructor, while a teacher for the deaf translated the words into hand symbols. "It contains 80 columns . . ."

Bukas Palad has won the prestigious Anvil Award for the most outstanding institutional program and has been commended by the government. Its graduates now have jobs with major companies such as the San Miguel Corporation and the Philippine Long Distance Telephone Company. More classes and subjects are in the offing.

In her sunlit office at the National School for the Deaf, Virginia Gorospe, the school's principal, proudly shows a visitor snapshots of the keypunch students. "I believe," she says quietly, "that a country can be measured by efforts such as this."

(Continued from page 42)

Nevertheless, the nation has felt the rumblings of an unsettled world economy. Because of quadrupled oil prices and sharp increases in machinery costs, last year's trade deficit grew to $418-million. Inflation has been battled down from 40 percent to 14 percent.

Development loans have helped. They have come from the World Bank and the Asian Development Bank, and one of them—for $5.5-million—will make for improved port and market facilities in the Manila area, where 80,000 metric tons of sardines, mackerel, tuna, and anchovies are brought in during the year.

This kind of outside financing is welcome, but it has not tempted the Philippines into dawdling on its own confronting of problems. Last November, four cities and 13 towns were consolidated into a Metro Manila area for a concerted attack on the urban problems of its nearly 8 million people.

Now, plans call for the filling in of 12,000 acres of Manila Bay for a new city and airport, and for the construction of nuclear and thermal power plants in Bataan Province to help meet Metro Manila's energy needs. Flood control has a high priority, too, since Manila is only inches above high tide and sometimes becomes an Asian version of Venice during the rainy season.

Economic progress at home has encouraged the Philippines to look beyond its own archipelago and to explore with its Pacific neighbors the possibility of an Asian Common Market. Last year, a tariff agreement with Thailand was signed; and in February of this year, these two nations met in Bali with representatives of Singapore, Indonesia, and Malaysia to sign a treaty of economic cooperation.

"It is now natural and beneficial for us to think beyond our own shores," says IBM's Ray Reyes. "But we can only do this because we have come so far on our own journey." —ED GRIMM ■

"Awareness of computers is growing," says IBM Philippines General Manager Ray Reyes. He sees his country leading the way in Southeast Asia.

$1-BILLION

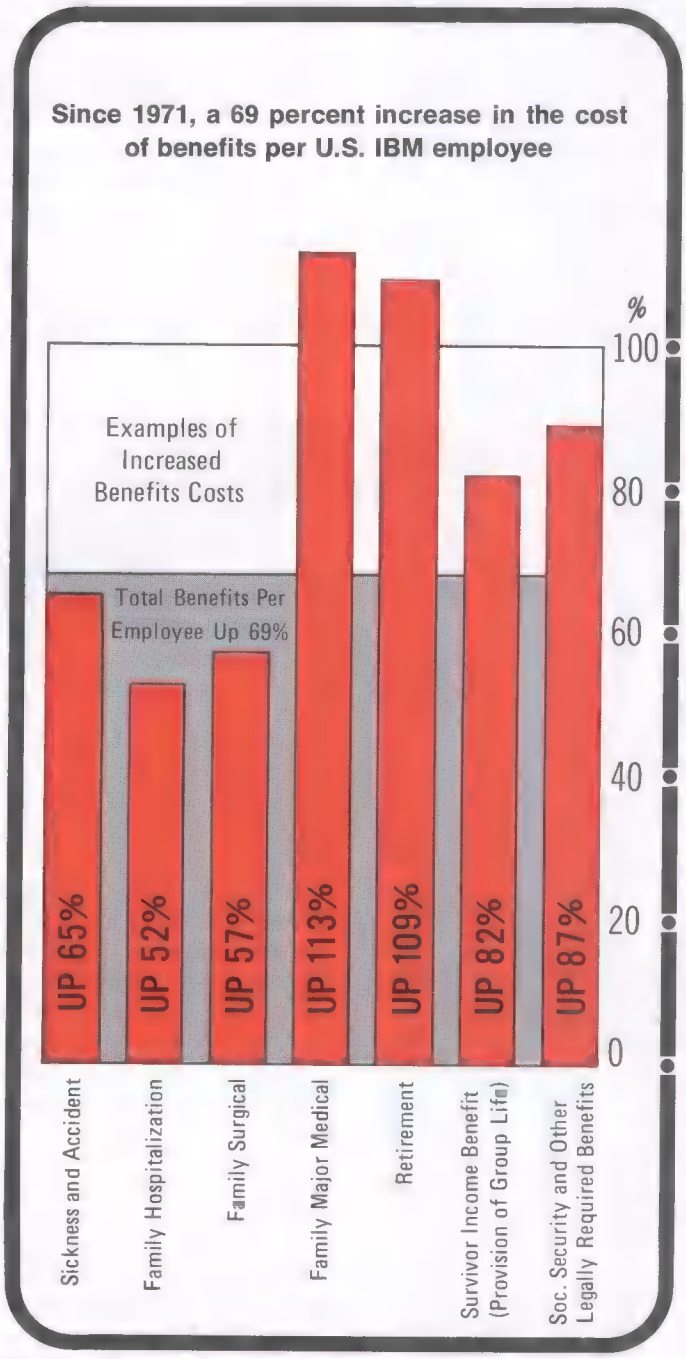
That's what employee benefits cost the company in the U.S. last year

The cost of employee benefits to IBM in the United States in 1975 topped $1-billion for the first time. Benefits cost, on the average, about $6,400 per employee last year—a 69 percent increase since 1971 due to plan improvements, higher salaries, and the coverage of increasing costs.

Further improvement in benefits was announced April 8 when increased IBM Family Dental Plan allowances went into effect for most procedures.

The IBM benefit plans are noncontributory. That is, the company bears their full cost.

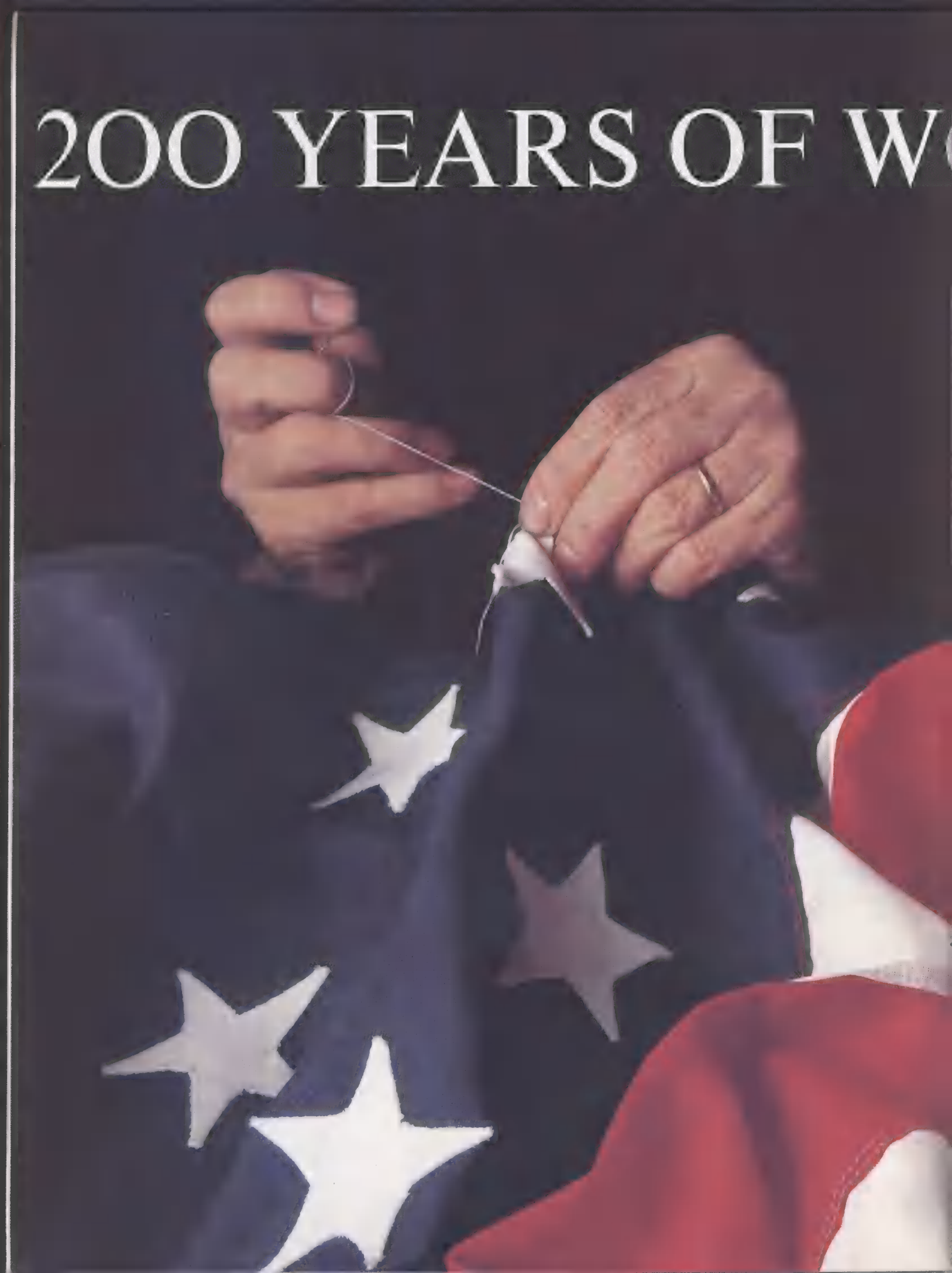
Since 1971, a 69 percent increase in the cost of benefits per U.S. IBM employee



Next Issue

Bicentennial Special

200 YEARS OF W



ORK IN AMERICA

With

Eric Sevareid

John Chamberlain

John Gardner

Studs Terkel

E. J. Kahn, Jr.

Carolyn Bird

Daniel Bell

Max Ways

Patricia Brooks

Oscar Handlin

Brooks Atkinson

Alex Groner

Arthur Bernon Tourtellot

Herman Kahn

Gerald Carson

Lester Brooks

Arlene Silberman

Monroe W. Karmin

Myron Kandel

Elting Morison

and others

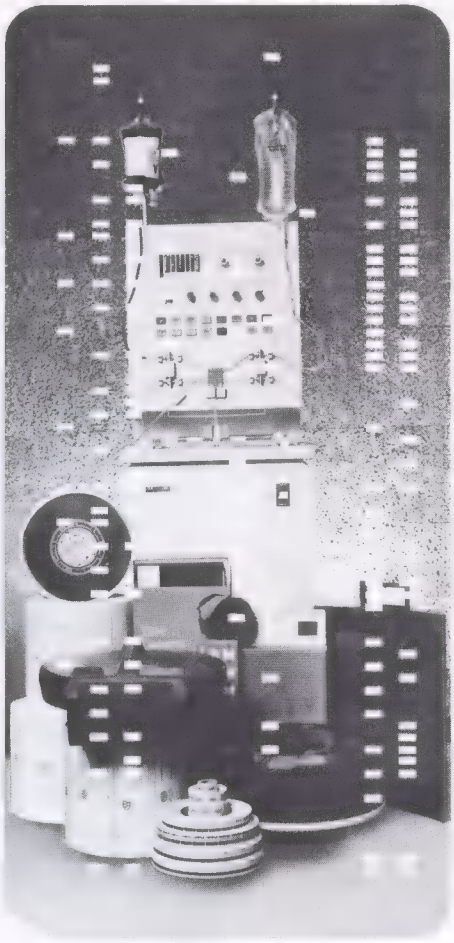
The presentation on page 45 was developed by the Office of Charles and Ray Eames for ***The World of Franklin and Jefferson***. The exhibit is sponsored by the American Revolution Bicentennial Administration. It was developed by the Eames' Office in cooperation with New York City's Metropolitan Museum of Art, with the aid of a grant from IBM.

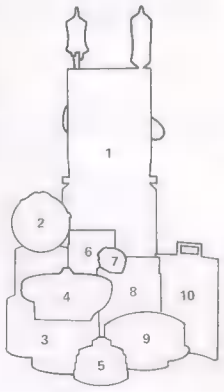
Midway between New York and Philadelphia, near the New Jersey Turnpike, the headquarters of the Information Records Division sits pertly in the flat New Jersey landscape, some six miles from the rising Gothic towers of Princeton University.

Symbolically, this IBM marketing and manufacturing division straddles the company's past and future. Some IRD people in today's Washington, D.C., plant, which prints all U. S. Treasury Savings Bonds and checks, still recall working in the old Hollerith building in Georgetown known for years as "Plant Number One."

The contrast is brought out in a walk through the division's Dayton, N. J., plant, where new things are continuously bubbling up next to old. In one area, a row of rotary card presses, latter-day descendants of a machine developed in 1921 by Fred Carroll (an early IBM inventor), print and cut streams of punched cards, long a staple of the division. Nearby, a high-speed Webtron Press turns out as many as a million magnetically striped merchandise tags in a single shift, racing to keep up with orders for the supply items to support IBM's new Retail Store System customers. Such magnetically encoded labels, tags, and tickets are a growing and important element in IRD's future. In still another area of the plant, technicians are assembling and testing the IBM Blood Cell Processor, the blood washing machine for which IRD has worldwide manufacturing and U. S. marketing responsibility. The Blood Cell Processor is used to "wash" red cells to decrease potential transfusion reactions and reduce the chance of post-transfusion hepatitis. It is used in community blood banks, Red Cross blood centers, civilian and military hospitals, and research laboratories.

"We continue to look for new products, additional missions, and new ways of doing things," says Edward F. Mosner, IRD vice president, marketing. Cards, paper forms, printer ribbons, and magnetic computer tape remain important. The Greencastle, Ind., plant, now operated by the Office Products Division in support of IRD's customers, turns out a tremendous variety of forms and special-purpose punched cards. Input/output media to support Data Processing and General Systems Divisions' systems continues to remain the mission for IRD. But today, it is taking vastly different forms. Revenue leaders include diskettes, disk packs, and data modules. The division is just now beginning to realize important new revenues from data cartridges for the IBM 3850 Mass Storage System, as well as supply items for the IBM 3800 Printer Subsystem, which combines laser technology and electrophotography to whip off reports at 13,360 lines a minute.





1. IBM 2291 Blood Cell Processor; 2. Reel of multisystem tape in Easy Load Cartridge; 3. Rolls of customer billing statements; 4. IBM 3348 Data Module; 5. Rolls of Universal Product Code adhesive labels (top) and magnetic-striped retail tags; 6. IBM Diskettes; 7. Continuous loop System/32 printer ribbon; 8. Box of microfilm aperture punched cards; 9. IBM 3336 Model 11 Disk Pack; 10. IBM 3800 Printer Forms Overlay.

You don't have to be big to be good

The prime mover behind all of this activity is the IRD sales force. The typical sales rep handles over 300 accounts, produces over $600,000 in yearly revenue, and operates in a highly competitive environment where IBM's service and responsiveness are key factors in customer support. The division has sales and administrative people in 85 branch offices managed by 23 area managers. Most sales representatives, except for those marketing the Blood Cell Processor, sell the entire array of IRD products. The division last year took well over 200,000 orders, with the help of a highly efficient branch office administration staff that works closely, on a daily basis, with manufacturing to fill numerous emergency requirements from IBM customers for supply items so essential to their systems operations.

The 1975 recession hit the division with a double whammy. Not only did last year's lagging economic activity cut into customers' use of supplies, but in 1974, a time of shortages, many people had stockpiled items for some time to come. Even so, IRD stepped up the pace in the second half through a very successful SuperStars Marketing contest and a 3348 Data Module Purchase Emphasis Program to wind up the year at 105 percent of total quota.

IRD is one of IBM's smallest divisions; but, far from being viewed as a handicap, IRD's size appears to engender self-sufficiency, resourcefulness, and high élan among its people. Some examples: IRD Hundred Percent Club President Gerry Francis developed a two-hour videotape for a large insurance company, to help teach its computer people care in the handling of IBM products such as disk packs.

Out in Houston, Marketing Rep Mike Gold sold and installed 21 Blood Cell Processors in 1975, accounting for more than a half million dollars in revenue; in Miami, Marketing Rep Jane Klein took on responsibility for a large airline account that hadn't used IBM computer tape for at least five years and didn't intend to switch.

"She established rapport at all levels," says Larry White, a DPD sales rep. "Most important, she quickly determined with the customer exactly what services we'd have to provide to get the tape business, and she got it."

How does IRD President David E. McKinney, size up his division? "We pride ourselves on being responsive—fast on our feet. With that all-in-one-business feeling, we get things done at a lively pace. We have a highly dedicated group of people throughout IRD who support the GSD/DPD customer set with a spirit that is unique and refreshing." ■

—GEOFFREY D. AUSTRIAN

Edited by RUTH BAKER and CLAIRE STEGMANN

N BRIEF IN

U.N.'s gain

"Trying to bring the world together is an interest that I enjoy thoroughly," former Governor William W. Scranton of Pennsylvania told *Think* in 1973, when he became a member of IBM's Board of Directors. Before that, he had been a director of the IBM World Trade Corporation from 1967 to 1971, when he resigned to become a member of the President's Price Commission.

Scranton has also served in government both as a member of the U. S. Advisory Committee on Arms Control and Disarmament and in special Presidential envoy assignments to the Middle East and to the European Economic Community.

In March, reluctantly, IBM accepted Scranton's resignation from the IBM Board to make him eligible for a new post. He is the new U. S. Ambassador to the United Nations, succeeding Daniel Patrick Moynihan.

Relief for quake victims

When at last the land grew quiet, 23,000 Guatemalans were dead, whole towns and villages leveled. That was two earthquakes and 1,300 tremors after the horror began in the early morning of February 4.

Within hours of the first quake, Nadal Antonioni, regional general manager, and Danilo Garcia, operations support manager, from Mexico City, arrived by charter flight. They brought emergency funds with them, and Garcia went on to El Salvador to arrange for food and medical supplies for IBM employees, to arrive by truck the following morning.

Fortunately, most of the tall structures of Guatemala City were spared, and consequently no employees or members of their families lost their lives. But the homes of 16 were severely damaged. IBM Guatemala, under the direction of General Manager Eugenio Ojeda,quickly set up emergency loans for those who needed them and paid salaries in advance to all.

IBM offices sustained only broken windows and structural cracks. Few customer installations were affected by the quake. Those that were, relied on backup equipment at other customer installations or the IBM data center facilities in Guatemala City to keep operating. A System/370 Model 115, at Empresa Electrica, which survived both quakes intact, was evacuated by crane because of severe damage to the building.

IBM Guatemala donated $10,000 to the government's emergency relief committee, a sum matched by the IBM World Trade/Americas Far East Corporation, in a grant to the Pan American Development Foundation.

This was not General Manager Ojeda's first experience with earthquakes: He was general manager of IBM Nicaragua when a quake devastated Managua in 1972. "We are very proud that we were back on our feet so soon," he says.

Clam champ

So, lawsuits proliferate, stocks fluctuate, and the economy is less than shiny bright? Never mind. IBM has made the 1976 *Guinness Book of World Records*—with the world's champion clam eater.

He's Don Haynes, of the System Products Division, Endicott, and in February, as duly noted by the local and the New York City press, he ate 251 clams in just 29 minutes and 38 seconds. By so doing, the trim 155-pound IBM associate systems analyst beat out the previous champion, a 220-pound West Coast policeman, who had managed only 162 of the mollusks in nearly twice the time.

It was all for a good cause, a cancer charity sponsored by a local radio station. The New York State Guinness representative was on hand to make Haynes's 7:45 a.m. meal official. So was Binghamton Mayor Alfred J. Libous, who acted as timekeeper. The shells, provided by a local restaurant, were numbered and sold for a dollar apiece.

N BRIEF

Hall of Fame

Thomas J. Watson, Jr., Chief Executive Officer of IBM from 1956 to 1971 and now Chairman of the Executive Committee of the Board of Directors, was named by *Fortune* magazine in January to the Hall of Fame for Business Leadership—one of four living businessmen so honored this year. In its citation, *Fortune* wrote:

"Without doubt, the two greatest business developments of this century are the automobile and the computer. All over the world, IBM and the computer have become synonymous. In the years 1956-71, while this was happening, the boss of IBM was the astute, articulate, personable Tom Watson, Jr. Like other successors to famous fathers, his achievement tends to be obscured by the assumption that all he had to do was pick the right parents. But Tom, Jr.'s IBM was so different from Tom, Sr.'s in size, product, and internal character that a lot more than familial descent had to be involved . . .

"Thomas Watson, Jr., says he doesn't feel 'noble or heroic' about the millions of men and women who have been released from arithmetic drudgery by the computer revolution. He is, however, impressed by the capacity of the U.S. and other societies to absorb these displaced workers, most of whom found better, 'more human,' jobs. This happy result is one reason Watson looks back on his career with satisfaction."

Scouting

"In earning merit badges, I got ahead of one of my friends. His assignment was to make bean soup and he forgot to put in the water. So he flunked cooking."

Reminiscing in a light vein, IBM President John R. Opel took time out in early February to accept the Distinguished Eagle Scout Award from the Westchester-Putnam Council of the Boy Scouts of America. The award is given annually to an Eagle Scout who has distinguished himself in his career or in public service.

Opel, who became an Eagle Scout in 1940 as a member of Troop 7 in Jefferson City, Mo., and has continued to be active in Scouting, also had some serious thoughts on its value.

"Through Scouting, we were given the facilities and the encouragement to achieve, to develop greater self-confidence We learned teamwork, mutual respect, responsibility, and good citizenship."

Happenings

Exhibits

The World of Franklin and Jefferson
New York City
Metropolitan Museum of Art
Fifth Avenue at 82nd Street
Through May 2
Hours: Tues. 10-8:45; Wed.-Sat. 10-4:45; Sun. 11-4:45 (Closed Mondays)
Voluntary contribution to get into Met; no extra charge for special exhibitions

The History of IBM Data Processing
New York City
590 Madison Avenue
Windows on Madison Avenue and 57th Street
Through the end of the year

America on stage:
200 Years of Performing Arts
Washington, D.C.
John F. Kennedy Center for the Performing Arts
Through Dec. 31, 1976
Hours: 10:15-8:15, seven days a week
Admission: Free

TV (Check local listings for stations, dates, and times in your area.)

Behind the Lines
Host: Harrison E. Salisbury
PBS Network: Tuesdays at 8 p.m.* through May 11
PBS/WNET/13: Wednesdays at 8 p.m.* through May 12. Sunday repeats at 6:30 p.m.* through May 16
* Eastern Time

RE-RUNS (If you missed them, here's another chance.)

Love Among the Ruins
Stars Katharine Hepburn and Laurence Olivier
ABC
Sunday, June 13, 9-11 p.m. Eastern Time

The Tribal Eye
Seven-part series of one-hour programs on tribal societies
PBS Network: Wednesdays, beginning April 28, 8 p.m.* Sunday repeats beginning May 2, 7 p.m.*
PBS/WNET/13: Sundays, beginning April 18, 8 p.m.* Thursday repeats, beginning April 22 at 9 p.m.*
(On repeat broadcasts, captions of the narration will run at the bottom of the screen for those with impaired hearing.)
* Eastern Time

Miscellaneous

Operation Sail
More than 200 ships from all over the world celebrate the Bicentennial
New York City
July 4, parade of ships up the Hudson River, starting at 11 a.m. from Verrazano-Narrows Bridge to Spuyten Duyvil
July 5-7, sailing ships and naval vessels in port will be open free to the public. "Tall ships" berthed in Manhattan; several at South Street Seaport at foot of Fulton Street on South Street (Piers 15 and 16). The rest, docked along Hudson. (For further info, query "Op Sail"—One World Trade Center, 72 N., NYC, 10048.)

New name on the door

It's General Business Group/International. Here, a look at some GBG people in 17 countries. They're part of a fast-growing business.

"If one of us does well, we both are pleased," says Peter Schumacher. But there's no need to worry. In March, both Peter and Elizabeth Schumacher made the IBM Switzerland Hundred Percent Club. Although it is not uncommon for husbands and wives in Switzerland to work for the same company, the Schumachers, who met while attending the University of St. Gallen, share the small country of Liechtenstein as their exclusive sales territory.

While they did not meet on skis, Peter and Elizabeth Schumacher put in as much time on the slopes as possible in their native Switzerland. They also enjoy good books and take in the latest films. But the Schumachers have still another interest that few other husbands and wives can claim in common. While the world is not exactly their oyster, the Schumachers share an entire country as their exclusive sales territory. He is the General Systems marketing representative; she handles Office Products. And, between them, they are the IBM marketing team in Liechtenstein (population 22,000) where they meet over lunch once a week. They often discuss the 30 customers they have in common in the tiny principality and 40 miles away in Switzerland where they work out of the St. Gallen branch.

Since last July, the Schumachers and some 27,000 other GS and OP employees in 17 countries overseas have been operating within a new management framework. In the countries, from Austria to Venezuela, newly appointed General Business Group managers are giving GS and OP activities greater autonomy within the country organizations. At the same time, General Business Group/International staff in Port Chester, N.Y., is providing functional guidance on matters ranging from planning and marketing to service and manufacture. And two U. S. divisions, OP and GS, have taken on worldwide responsibility for their product lines.

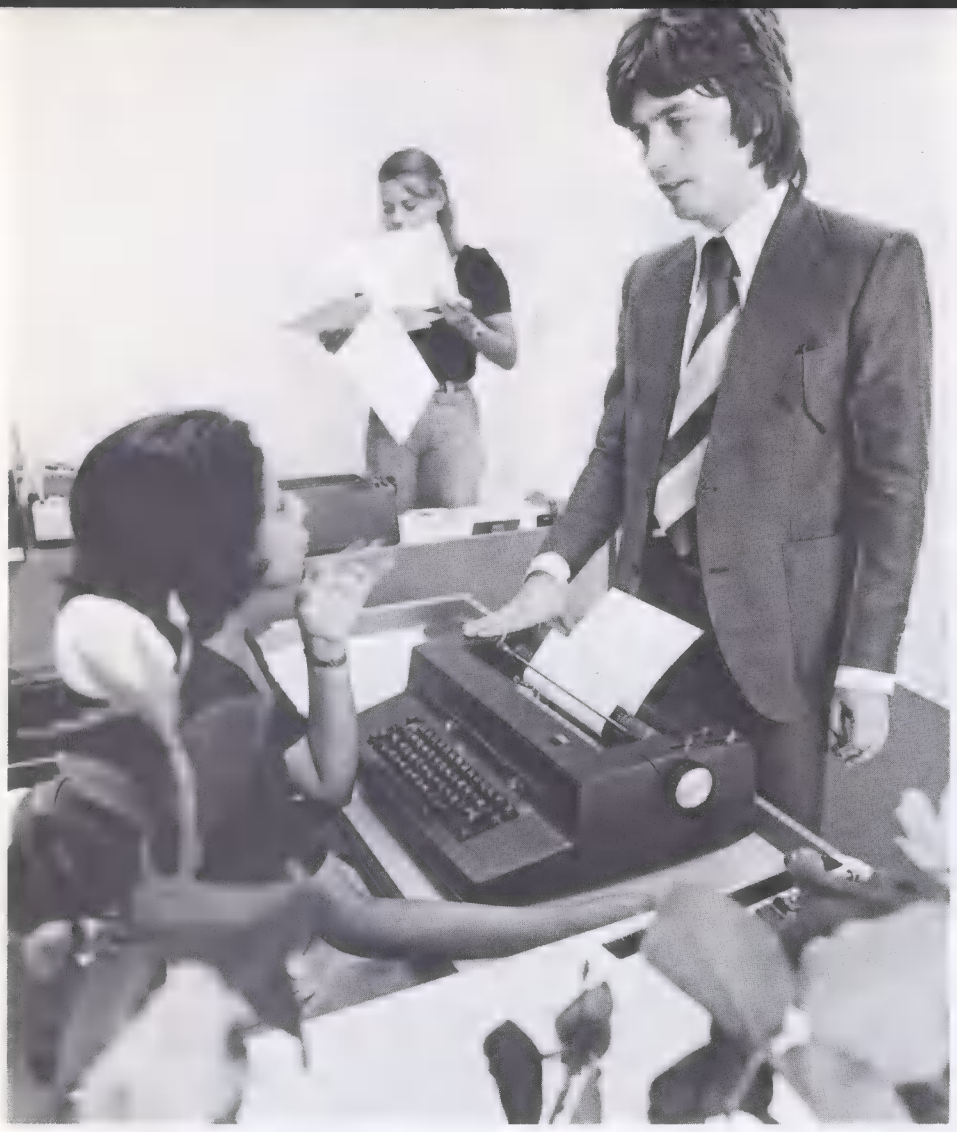
In the last six months, GBG/I President Richard C. Warren has visited all but one of the countries within the GBG/I orbit. "Our job," says Warren, "is to help the GS and OP business grow at its highest possible rate in the 17 countries that produce 85 percent of GS and OP revenue overseas."

That already appears to be happening. GBG/I exceeded all major sales goals in 1975 and is optimistic about duplicating the feat in 1976.

Following, some of the members of the GBG/I family.

Above: The 17-year-old graduate of a Brussels technical school went to a professor for advice. Look into joining "Watson-Belgium," he was told. He did. The year was 1945. And, a year later, Georges F. Leveugle was installing unit record equipment at a U.S. Army installation—the first equipment installed by a customer in Begium since before the war. He shifted from customer engineering to sales in 1950—and married the secretary to his marketing manager. Since then, he has made 16 Hundred Percent Clubs as a salesman (he has sold everything from time recorders to typewriters to computers) and another nine Clubs as a manager. Although as GS sales operations manager today Leveugle is responsible for four branch offices, he still makes at least one customer call a day. Strictly business, he has hammered out his own philosophy on the need for being a complete businessman. "You have to believe that selling is an important profession," says the dapper Leveugle, "which I do."

When the Australian cricket team visited Britain last summer, transplanted Aussie Ian Gillespie took his entire Croydon GS branch to the test match at Lord's Cricket Ground to witness his countrymen give the home team a sound drubbing. "We needed an outing to put the branch together," says the 6′ 4″ Gillespie who weighs in at "18 stone" and admits to having been something of a slugger in his cricket playing days at the University of Melbourne. The branch manager's competitive spirit is infectious. In March, Croydon was singled out at the U.K. Hundred Percent Club for selling "breakthrough" applications. Among them: England's first System/7 telephone entry system that enables a chain of 70 drug stores in southeast England to replenish its shelves on a daily basis via overnight calls to the computer.



Everything's coming up roses for 24-year-old OP sales rep Luiz Lima. The member of the Rio de Janeiro branch, who happens to be a two-time Brazilian judo champion, sold 92 Selectric Typewriters to Itaipu Binacional, a joint Brazilian-Paraguayan corporation that will build a $5-billion dam project on the Parana River between the two nations. "Brazil is a huge country," says Lima, speaking of the sale, "and we need energy to grow." Recently married, Lima and his wife, Angela Maria Correia Moriera, spend many evenings studying administration and social sciences at the Federal University. He has made three Hundred Percent Clubs since joining IBM in 1972.

She is disappointed when she puts on a good customer demonstration—and the sale doesn't go through. But that doesn't happen very often to OP Marketing Support Representative Margareth Stadlbauer, of the Munich branch office. Last year, she ran 195 product demonstrations in the branch, carried out 17 customer analyses, more than half of which resulted in sales, and trained 125 customer operators on magnetic media and dictating equipment. She also worked with 12 marketing reps in successful sales of three word processing centers. A marketing support rep for the past three years, she began her IBM career as a secretary—"the best training in the world" for her present job.

In Japan, where OP marketing reps often make calls in tandem with customer engineers, Mitsuo Sango (foreground) stops by at the Tokyo firm of Mitsubishi Shoji Kaisha with Shoichi Ichikawa (servicing machine in background). Sango has made Japan's Hundred Percent Club every year since joining IBM six years ago from a trading firm. He was recently promoted to a marketing post in Nagoya. Once a technician in Japan's National Defense Force, Ichikawa now specializes in Memory Typewriters. Both are avid sportsmen. Sango seldom misses an opportunity to play golf in a land where the sport has become a near-obsession. Ichikawa especially likes tennis, baseball, and fishing.

Banking goes retail

(Continued from page 7)

it is testing IBM teller terminals, and when they go on-line, the plastic card will be an element in their operation, too.

The bank plans to install 3604 keyboard displays and 3610 document printers—all part of the 3600 family—at 54 teller work stations at its headquarters and all six branches. When the installation is completed later this year, a customer's various accounts will be tied together via an IBM Field Developed Program called Customer Information File, which runs on the bank's System/370 Model 145.

The software package will process nine applications in all, including such things as checking and savings, Master Charge, loans, and Christmas Club accounts. One of the major advantages of his 3600 system, Craig notes, is that the customer will be able to go to any automated or live teller at any location, produce a plastic card, and do business with the bank in an expeditious way.

Both Craig and O'Connor see the plastic card concept as a step toward the creation of interest-bearing checking accounts. With either the Cash-Flow or the ABBY concept, a depositor can keep low balances in a checking account and readily transfer money from a savings account to cover a check draft. Ultimately, both bankers envision "zero-balance" checking accounts in which the bank is authorized to make automatic transfers to cover check drafts, so, all deposited funds would be drawing interest all the time.

The question of checking accounts is an especially thorny issue for mutual savings banks and savings and loan associations since they are prohibited by law from offering checking accounts. As a sort of compensation, they are allowed to offer higher interest rates on savings than commercial banks. Their way was eased somewhat in May 1975 when Federal banking regulations were changed to permit them to make third-party payments.

Florida's Hollywood Federal Savings and Loan Association in fast-growing Broward County (one of the top 60 savings and loans in the nation), immediately implemented a payment concept, which it calls Bill-O-Matic. Depositors can phone the Association and authorize it to pay a bill and debit their savings account accordingly. The Association now pays about 5,000 bills a week.

What it hopes, of course, is to attract additional savings accounts from local business firms and professionals so that the transfer of funds from payer to payee becomes a purely internal electronic transaction. "Basically, there are two things we can do to attract more customers," says J. C. Fortson, senior vice president and treasurer. "We can conduct promotional 'giveaways' or we can invest in electronic equipment that will improve our customer service. We prefer to improve our customer service."

Last December, Hollywood improved its service even further by installing point-of-sale terminals in 16 local supermarkets. The point-of-sale devices are linked to an IBM System/7, which in turn is connected to a System/370 Model 135. The supermarket terminals allow the Association customers to deposit funds, make withdrawals, or pay for their groceries without cash or checks.

Here again, the EFT concept is built around the issuance of a plastic card to activate either the supermarket terminals or the IBM 3600 teller terminals at 105 work stations. Holders of plastic cards turn in their passbooks and receive instead a monthly statement that itemizes the status of their accounts.

Fortson believes passbooks are outmoded, and depositors will forsake the passbook concept more readily than bank personnel. "Some of our employees argued that customers would never abandon their passbooks," he said. "But we put an end to the vested interest in passbooks by having the president rip up his passbook and accept a plastic card in its place. Then we told employees to issue plastic cards to customers. And they did. Within a few months we had taken in about 10,000 passbooks and issued 20,000 cards to old and new customers combined." But, Hollywood Federal still has a way to go, since it has 60,000 depositors.

Fortson believes sooner or later banking laws will be changed so that there will be little difference between savings and loans and commercial banks. "When that day comes," he says, "we'll be electronically ready to issue checking accounts."

Then he adds thoughtfully: "Of course, that day may never come. But even if it never comes, we'll still be one step ahead of our competition. So either way, we come out ahead." ■

Coming:

The changing world economy

What are the forces shaping international trade and what are the implications for U.S. business? Dr. Peter Kenen, professor of economics and international finance at Princeton University, discusses these and related questions in Part VI of the series on business and how it works.

Speak Up

A whitewash? Or is it for real?

When a Field Engineering Division employee in the Anchorage office answerd his phone, he was astonished. The caller was Eileen Welsh, Speak Up coordinator for the FE Division in White Plains, N.Y. The Speak Up he had sent to her directly for a reply, she explained, required clarification. She wanted to expedite getting an answer for him, so she called. He was impressed.

Others have been, too, judging by a recent survey about the program:

- "To be honest, I didn't really expect results. I was very pleased. Evidently Speak Up is not just a sounding board—somebody really does listen and act."
- "After trying . . . for many months through normal channels, the Speak Up brought an immediate response. I have tried this program before, and it helps."

But there were brickbats as well:

- "An unconvincing parroting of policy without a well-reasoned explanation."
- "The answer to my Speak Up was not unlike what I had expected—another 'cop-out.' "
- "The answer didn't address my questions. It was evasive and 'canned.' "

Speak Up is not a new concept, of course. It was introduced more than 16 years ago as an experiment in San Jose. By the end of 1975 there had been a worldwide total of 150,000 Speak Ups, though the annual submission rate has slackened over the last few years. Many other companies—among them, Eastern Airlines, Bendix, and CIBA-Geigy—have modeled their programs on IBM's.

Last year the five categories of greatest IBM employee interest were: parking facilities, employee/manager relations, vending machines, smoking, heating-air conditioning-ventilation—in that order. Not all Speak Ups are complaints or questions. Running a close sixth was the "Thank you" to the company for something it had done.

What has been the "follow-through" record of Speak Up in IBM? In many situations it has proven an effective way to get results, such as: changing the qualifying date for employee vacations; creation of no-smoking areas in cafeterias; removal of safety hazards that had been overlooked; elimination of the plant vacation shutdown. (Previously, employees were required to take vacations at the same time each year.)

Still, some people share the apprehension of one who noted: "I have never written a Speak Up . . . I know that it's not that hard to find out who wrote it. Once this is known, that person is usually a 'marked man.' "

Not so, says Bill Winger, manager of Speak Up administration at CHQ. As a matter of company policy, the writer's identity is known *only* to the division or facility Speak Up coordinator. "That's why the form is designed so that the stub containing the employee's name can be clipped off and locked up," he explains.

Winger adds: "No matter what the question or complaint, we're committed to respond if it's signed. [Some 89 percent of last year's 11,620 worldwide total were signed.] Unfortunately, if people don't sign, they can't be given a direct answer. However, unsigned Speak Ups of general interest may be—and often are—answered in company publications."

How do those out in the field feel about the program?

Vince Connor, coordinator at Office Products Division Headquarters in Franklin Lakes, N.J., says: "Speak Up is at its best as an action-oriented program. The writer tells the company it is doing something wrong, management agrees, and a change is made. However, when management does not agree with the employee's point of view, it's important that the answer provide a clear explanation of the company's position on the matter."

"The program is a two-way street," says Rose-Marie Stevens, coordinator at Data Processing Division Headquarters in White Plains. "It gives IBMers the opportunity to sound off or to ask questions—confidentially—about the way the company does things. At the same time, it helps management identify and correct problems or react to employee concerns."

That is exactly what happened at the System Products Division plant in Poughkeepsie, according to Lou Voerman, SPD vice president and general manager of manufacturing, Brooklyn/Kingston/Poughkeepsie: "With the integration of Kingston-Poughkeepsie functions, we've had an unusually high rate of Speak Ups. They have been an enormous help in uncovering some concerns we weren't aware of, and have made it possible for us to take action and correct misunderstandings."

Jim Cook, manager of the General Products Division plant in San Jose, agrees: "The program offers insight into the things that bother our people. And like IBMers everywhere, they're not bashful about letting us know if they feel something's wrong. It's an example of the mutual trust between IBM employees and their management." ■

Over the past 16 years, Howard K. Janis's by-line became familiar, and welcome, to readers of IBM publications. He wrote with authority and skill, especially on complex technological subjects, in recent years as a *Think* senior editor-at-large. We wish to share our sorrow at his passing with many of our readers who had come to know and respect him.

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It was dinner for 250 guests, hosted on March 3, by IBM Chairman Frank T. Cary at New York City's Metropolitan Museum of Art. The occasion: a preview of *The World of Franklin and Jefferson,* an IBM-sponsored salute to the Bicentennial. The exhibition has already drawn record crowds in Paris, Warsaw, and London. Next stop is Chicago, in July, then on to Los Angeles in November.

Mr. and Mrs. Frank T. Cary pass through replica of 18th-Century New England doorway, which divides the exhibition's two major sections.

Left: Guests dine in Medieval Sculpture Hall of the Metropolitan Museum of Art.

Report from Foley Square

In May the Justice Department vs. IBM antitrust trial will be a year old. A catch-up report on what's been happening in the Federal Courthouse on New York's Foley Square.

Page 32

From Boulder—the new 'Everything Machine'

It's the new Series III Copier line—fast, easy to use, packed with innovations. From Office Products with pride.

Page 16

IBM Philippines

A small company in the World Trade lineup with only 283 people. But, like their country, confident and coming on fast.

Page 40

Taming the dragon

Econometrics. The biggest thing to happen to economics since the law of supply and demand? Or just a new kind of statistical gimmickry? A look at how economic models seek a fix on the future.

Page 36

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